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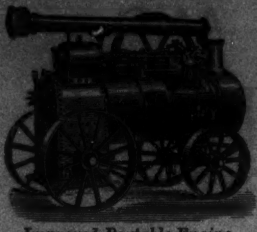

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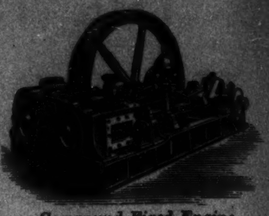

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THE TELEGRAPHIC JOURNAL AND

Electrical Review.

VOL. XV.—NO. 349.

## INVESTIGATING COMMITTEES.

THAT element of non-success which has been so conspicuous in connection with the greater number of recent commercial enterprises in which electricity has formed the staple plea for enticing money from the purses of the public, has not absented itself from the career of the Consolidated Telephone Construction and Maintenance Company, Limited, the past history of which is now being closely scrutinized by a committee of shareholders. It is quite usual, when the sanguine expectations aroused by the plausible promises contained in prospectuses are followed only by disappointment and loss, for the victims to vent their chagrin upon those who have been responsible for the management of the concern; but it does not very frequently happen that there are insinuations of any misdemeanour more serious than mismanagement. The investigating committee of this company, however, has issued a report which contains accusations of a strong character, directed, by implication only, against those who have formed the directorate during its existence, and, if these should be proved to be correct, the prosecutions and law-suits which are now hinted at would seem to have some justifiable grounds. We are inclined, however, to believe that the committee commenced its labours with too great a disposition to take it for granted that everything had not been fairly and honestly done, and, therefore—neglecting channels of authentic information open to them—rushed hastily to conclusions, based upon insufficient evidence, which a more extended and an unbiased enquiry would not have led them to. Various causes have conspired to limit the remunerativeness of telephone manufacture in England, but these irate and disappointed shareholders recognise but one, for which "mismanagement" is the mildest term. Colonel Gouraud, in his comments upon the report of the committee, directly refuted several of the statements strongest in implied accusation against himself, and the truth of some of his corrections was admitted by Mr. Fitzgerald at last week's meeting. One or two of the shareholders, also, whilst asserting their belief that there was much that required investigation, remarked that there were numerous inaccuracies in the report which time would not permit allusion to.

That an investigation of the affairs of the company, the manner of its promotion and subsequent transactions, was necessary, we fully believe, but that that investigation has been conducted with the requisite amount of care and thoroughness we think we have ample reasons for doubting. It is desirable that a wholesome check should be exerted over the action of managing boards in the shape of a possible investigation of their doings by the shareholders themselves, and we have never been backward in recommending the appointment of committees for that purpose, where it appeared to us that that course was advisable: but that the powers conferred upon such committees should be abused in order to gratify personal antipathies we deeply deplore. In the instance before us, the whole tenour of the report is only too evidently an endeavour to associate Colonel Gouraud with certain apparently questionable proceedings. In the first place it was stated that, having applied for 5,000 shares, he was allotted 15,000, whilst at present he holds only 625; upon correction, however, Mr. Fitzgerald, who may be said himself to compose the "committee," admitted that the actual fact was vastly different to his representation, Colonel Gouraud having been allotted only 3,250 shares; the shares which he had disposed of were sold at a time when he was not a member of the board of directors. Comment has been made upon the appearances and disappearances of Colonel Gouraud from the board; but we think that gentleman's explanation, given at the meeting in May, most satisfactory, testifying as it does to the honourable nature of his motives. His name appeared on the prospectus as deputy-chairman, but almost immediately upon the issue of this he was appointed by the President of the United States a member of a foreign mission, and, as he thought it probable that he would be absent from England for some months, he resigned his position rather than be responsible for the launching of a new business whilst he was abroad. Subsequently, during last year, he was pressed to again join the board, which he at first declined to do, but, after urgent solicitations, he consented. This occurrence has been referred to as suspicious, but in what way it is so we fail to see. Colonel Gouraud answered the personal allusions to himself, and at the meeting last week declared his willingness to reply to any question with regard to transactions which originated whilst he occupied a seat on the board; but no questions were put to him, and he did not go further into the matter, contenting himself with repelling the attacks upon himself, which impartial readers will perceive that he succeeded in doing.

One somewhat singular circumstance, however, which the committee have elicited, in regard to the past members of the board, is the fact—it is stated as such and has not been contradicted—that, with one exception, all the original promoters have ceased to have any connection with the company. As we have before indicated, it is pretty clear that the conduct of all who have at different times been concerned in the management of the company has not been such as to reflect upon them the greatest amount of credit, and we trust the investigating committee will pursue its researches until the irregularities, if there have been any, have been traced home; but what we strongly deprecate is, the spirit which appears to have animated the committee, and the hasty manner in which assertions were made without due care being taken to ascertain that they were strictly true, or that the circumstances would not admit of a more favourable interpretation. That Mr. Fitzgerald's energetic investigation will bear good results we do not doubt. Already he states that there is a prospect that the manufacturing business will not continue to result in a loss, and he gives hopes of successful business in those countries in which the company has interests. Shareholders in other companies, too, who have reason to be dissatisfied and suspicious, will, seeing the success which has attended his efforts, be more inclined to take a similar step, or, at any rate, the possibility of their doing so will, no doubt, act wholesomely upon any directors who may have a tendency to self-aggrandizement, regardless of the shareholders' wishes and pockets.

## THE CLAY TELEPHONE SYSTEM.

THE Clay Commercial Telephone Company of Philadelphia has established in that city an exchange which has now about 250 subscribers. We also learn that over 400 subscribers have been obtained to an exchange for the benefit of the public generally of the city.

Mr. Clay, who is now in this country, has kindly brought before our notice a complete set of his telephonic apparatus, which we herewith illustrate and describe for the information of our readers.

Figs. 1 and 2 give views of the Clay receiver. Fig. 3 is a perspective view of the Clay call, transmitter, receiver, and battery-box. Fig. 4 is a sketch of one of the Clay transmitters, and fig. 5 is a view of the Clay exchange-switch which is operated by any two of the subscribers themselves whenever they have ceased talking with each other.

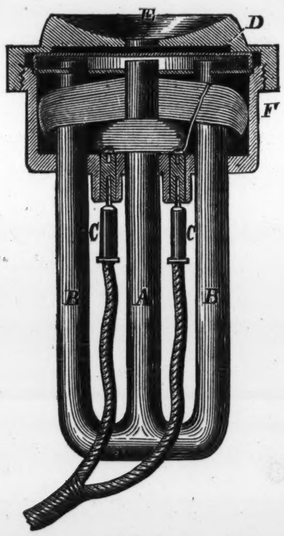

FIG. 1.

The receiver is best shown in fig. 1. A, B, B, represent a permanent steel magnet of which the limb, A, is of one polarity, and the two limbs, B, B, have their magnetism of opposite polarity divided between them; so that there are presented to the ferrotype diaphragm, D, three polar ends, the centre one being say of north polarity, and the other two of south polarity, each one-half as strong as the middle one. The circular diaphragm, D, is of ferrotype iron, and has its edge turned down to form a rim, as with a tin box-cover, to fit a shallow box made of ordinary sheet iron. This box has the centre of its bottom cut out so that there is considerable space between it and the pole of the limb, A. There are two holes cut in the bottom somewhat eccentrically to its centres, so that when the box is put in its place on the magnet poles it may, by turning it on its own plane, be caused to enter slots cut in the two poles, B, B, as shown, and be fastened in position thereby. When once so fixed in place and the diaphragm put on the box, there is no means of adjustment, and it is claimed that none is needed.

The box and cover may be said to be one pole of the magnet, and the end of the limb, A, the other. Of course, variations of the strength of current in the coils, F, of the receiver produce changes in the strength of the magnetic field corresponding to its primal strength. C, C, are the terminals of the usual receiver cord conductor, connected with the ends of the coil, F, of fine wire as usual. The winding of F is peculiar in its way of surrounding the poles. It is first wound as a skein of suitable size, and is then formed as shown and placed over the poles, so that it surrounds them all collectively but no one individually.

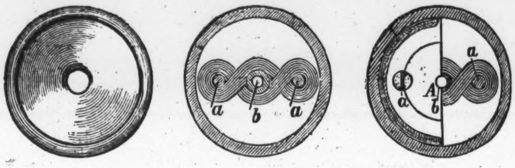

FIG. 2.

The receiver is hung upon a fixed hook as shown in fig. 3. When it is removed by the operator a tongue projecting from the box within the bow of the hook is raised by the removal. The raising of the tongue moves a switch within the box to make the necessary electric circuits. The battery jar is placed within the cupboard below the inclined shelf, and this latter is used as a place for writing while making notes of conversation over the line.

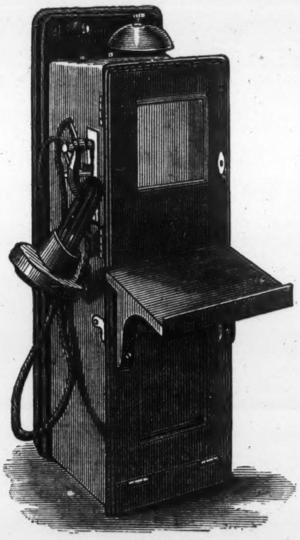

FIG. 3.

The diaphragm of the transmitter is of wood, square, between $\frac{1}{16}$ and $\frac{1}{8}$ of an inch thick, and firmly fastened at its edges to the box which encloses the other parts. At the centre of this diaphragm is fastened a metallic plate on which is a platinum contact-piece. A carbon tubular cylinder fits loosely on a wire, which is bent so that its end enters the hole in the carbon cylinder. This wire is soldered to a metal band, which is fastened to the insulating cover or casing of the induction coil. Between the carbon cylinder and the wire, and soldered to the latter, is another platinum contact. The core of the induction coil is a rod of very hard cast iron. One end of the core is loosely pivotted as shown, and the other end of the core is allowed to move loosely between the limbs of a U-shaped guide wire shown projecting from a piece of iron.

We need not repeat that increased pressure between contact surfaces, such as we are considering, decreases the resistance of the circuit, of which they form a part; that such decrease of resistance causes increase in the strength of currents flowing in the circuit; and that there is a corresponding increase of the magnetic attractive force of an electro-magnet within the circuit. In this case, then, increased pressure between the contact surfaces causes the end of the core to correspondingly attract the iron mass above it, and, as that mass is fixed, the core moves toward it to counteract the tendency which would otherwise become active, to break the contacts between the electrodes.

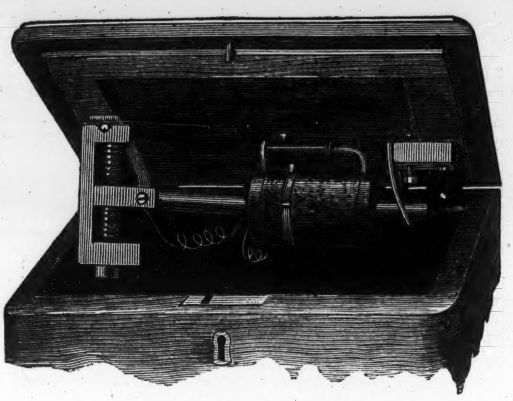

FIG. 4.

The transmitter is said to respond to a weak or loud voice equally well, though of course not in equal strength. Loud or violent talking does not produce a rattling sound in the receiver, as is the case with the ordinarily adjusted transmitters familiar to the public.

Fig. 5 is a view illustrative of the Clay automatic exchange switch and system. A perforated metallic plate, is in electrical connection with the telephone at the central office.

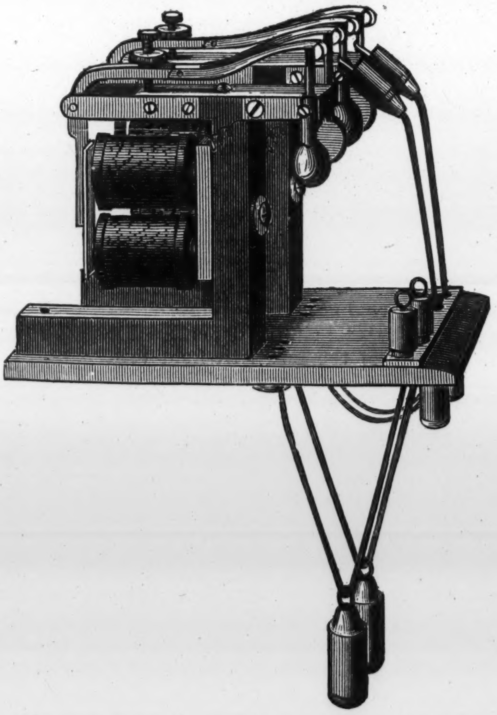

FIG. 5.

The armature of an electro-magnet is mounted on a base, and two catches are pivotted to it at the opposite end. Two levers are pivotted to the base, and are arranged to abut, respectively, against the catches when in normal position. This position is vertical, but a horizontal or inclined arrangement may be adopted instead. The levers are provided with springs or weights for holding them in a normal position, and they are insulated from the catches at the points of contact. They are also insulated from each other by the base, which is of wood, or other insulating material.

Each line wire depends from the perforated plate through one of the perforations thereof, and having at the top a metallic piece, which is held in contact with the wall of the perforations of the plate, the wire having an attached weight to ensure good contact. The top of each metallic piece terminates in an eye, which, when the wire is raised, may be fitted on either of the two levers. To complete the circuit a wire extends from earth to the telephonic instrument of the subscriber.

The operation is as follows :—When one subscriber wishes to communicate with some other subscriber, he first removes his telephone from its hook, which forms part of the signalling instrument. This removal allows the mechanism of the signalling instrument to close the circuit with the central office through the connections above described. After the central office learns the requisition from the subscriber, the operator takes the eye of the respective line wire and attaches it to the respective lever. In so doing, the eye is necessarily brought into electrical contact with the catch for said lever, and lifts the catch. As this catch is in metallic connection with the generator by means of the wire, a momentary circuit is established through the telephone of the first subscriber, and this produces a gurgling noise, which notifies him that his requisition is attended to. The wire of the subscriber who is called for is then manipulated in like manner, and when the metallic eye raises the catch with which it comes in contact, it completes a momentary circuit for that subscriber's notification like those above described, except that the signalling instrument and not the telephone of the latter subscriber is in circuit. He will thus be notified by the sounding of his bell. When the parties have finished talking, the telephones of their instruments are hung upon the respective hooks of their call-bells or signalling apparatus, which causes the mechanism of the latter to be set in motion. This generates a current of electricity for the call-bell mechanism, and this current is of sufficient strength to magnetise the cores of the magnets and attract the armatures, thereby raising the catches from the levers. The weights of the respective telephone wires will then cause the said levers to turn outwardly until the eyes drop off from them, thus breaking the circuit. The springs or weights of said levers then return them to their normal position, and the catches fall again by their own weight (the armature being no longer attracted) into the position shown.

There are as many of these automatic switches provided at each central station as are needed to work the necessary number of simultaneously operated pairs of subscribers' instruments. The Clay system is said to work most satisfactorily, and the exchange system appears to be particularly ingenious, but the inventor has some very curious ideas concerning the method of winding the coil in his receiver, the effects of induction upon his apparatus, and other minor matters. We do not agree with his theories ; but as our object is not to discuss with him but merely to describe his instruments, we need not now at all events enter further into the subject.

## VOLTA AND MAGNETO ELECTRIC INDUCTION.*

By WILLOUGHBY SMITH, M.R.I.

(*Continued from page* 8.)

ARAGO'S discovery that copper, a non-magnetic metal, was influenced by a rotating magnet, or that a magnet was, in the same way, affected by a rotating disc of copper; was looked upon at the time as a new and remarkable phenomenon in induced magnetism by philosophers both in England and other countries; but it was Faraday who, by the assistance of his knowledge of the evolution of electricity from magnetism, gave the true solution, by proving it to be the effects of electrical currents induced in the disc on account of its motion in a magnetic field. He not only proved by simple experiments the correct interpretation of the phenomenon, but he saw the way to making the discovery of Arago a new source of electricity, not despairing, by the aid of his knowledge of terrestrial magneto-induction, of being able to construct a new magneto-electric machine. For this purpose, he arranged an apparatus, similar to the one I have here, which is simply a permanent magnet so fixed that discs of metal or other substances can be rotated between its poles. Two wires leading one from each terminal of a galvanometer were applied to any desired part of the revolving disc, and the deflections on the galvanometer noted. The first experiments were made with a very large compound permanent magnet, and with what would now be termed a quantity astatic galvanometer. His discs of metal were twelve inches in diameter, and about one-fifth of an inch in thickness, fixed upon a brass axis. He experienced difficulty in making contact between the terminals of the galvanometer and the edge and other parts of the revolving disc, as also in maintaining uniform velocity of rotation. With a much smaller magnet and a more sensitive galvanometer, the results were more striking. Thus, with his accustomed simplicity, he demonstrated the production of a permanent current of electricity from an ordinary magnet, at the same time asserting that with powerful magnets and the rapid rotation of a copper disc, very strong currents would be produced. What a wonderful lesson this apparently simple machine teaches, for it is able to exert the power that has its origin within itself on external matter, without in any way exhausting or diminishing that power!

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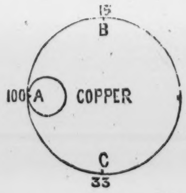
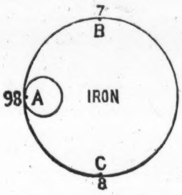
* A lecture delivered at the Royal Institution, June 6th, 1884.

The apparatus that I employed for my experiments is the same that I shall use this evening. On a stand is fixed an electro-magnet, the poles of which are so placed that the rim of the disc under experiment can be freely revolved between them. The total resistance of the wire is 13·75 ohms, and through this flows the current from 12 Leclanché cells. The same galvanometer is used as with the other experiments, being brought in circuit with the disc by means of the axis on which the disc revolves, and a metal brush which forms a rubbing contact on the rim of the disc; this, working on a fixed centre, can be readily shifted to any part of the circumference of the revolving disc. The disc is revolved by this cone-shaped pulley, worked lathe fashion, connected by an endless band to a small grooved pulley fixed on the same axis as the metal disc. We will now make a few experiments with the copper disc, which is now revolving at the speed of 1,000 revolutions per minute, and the connections are so made that the current will be taken from the rim of the disc just as it passes between the poles of the magnet. On pressing this spring the circuit is complete, and you observe the effect of the current on the scale of the galvanometer; it is about 100 divisions. We will now remove the contact to about one-fourth of the diameter of the disc or top position, so that the current will be taken at that distance from the poles of the magnet as the disc is approaching the poles; now, on completing the circuit, you observe the deflection is reduced to about 15 divisions. The contact will now be removed to the opposite side, or bottom position of the disc, so that the current will be taken at the same distance from the poles, but after that part of the disc has just passed between them; on completing the circuit you see the deflection has increased to 33 divisions. Let us note these results as follows:



We will now replace the copper disc with one of iron, and repeat precisely the same experiment. We find that the current from position A is so great that it is necessary to insert a resistance of 500 ohms in the circuit to bring the beam of light on to the galvanometer scale; as before shown, by means of inserted resistance we can obtain any desired deflection. It is now about 98 divisions, and that we will take as the right measure for position A. We take B or top side position, and you observe that the deflection is only seven divisions; the connection is now placed at position C or bottom side, and we get but very little more current, as the deflection is only increased by one division. The results with iron may therefore be noted as follows:—



500 ohms in circuit.

If we compare the results of these experiments with those obtained with the same metals in volta-electric induction, we see that iron remains fairly uniform in its results in both cases, but that copper behaves differently. You must not, please, take the figures given as being absolutely correct, the experiments having been somewhat hurriedly made, and merely given with the view of enabling you to understand the results of carefully made experiments with various metals. These results are graphically shown on the plate marked fig. 2, and, as the measurements are to scale, they can be directly compared with each other. The large circles represent the revolving discs, the small ones show the position of the poles of the electro-magnet, and the arrows the direction of rotation. The boundary lines show the electromotive force at every point round the revolving disc; thus in every case the strongest point is, as might be expected, directly in front of the poles of the exciting magnet, the strength gradually fading from thence on either side. The dark portions show the excess of inductive effect there produced, relatively to a point equidistant from the magnetic poles, but on the other side. If the current set up in the metal simply depended upon the intensity of that part of the magnetic-field through which the metal was passing, then equidistant points on either side of the magnetic poles should produce equal deflections, because the magnetic intensity is equal; on inspecting the diagrams, however, it appears as if a very sluggish inductive effect were produced in the diamagnetic metals of high conductivity, the sluggishness increasing with the conductivity of the metal, as though the atoms took a comparatively long time to accommodate themselves to the changes in the magnetic-field through which they were passing. This, I think, confirms the theory I have ventured to advance, with respect to copper while under the influence of induction.

If, as in the case of volta-electric induction, the lines of force are generated too quickly; or, as in the case of magneto-electric induction, the diamagnetic body passes too quickly through the magnetic-field; the atoms of the substance, in each case, have not time to polarise with sufficient rapidity to radiate in the same time or place as when influenced more slowly by this force. This would account for the apparent interruption of the lines of force by the copper plate in the volta-electric experiments, and also for the "drag" or retardation on the disc of the same metal as shown by the dark colour in the diagram whilst part of it is passing quickly through a magnetic-field. That being the case, it is easy to perceive that a speed of the copper disc might be attained when the current would be *nil*, through the atoms being unable to polarise in the allotted time. Not so with magnetic metals as iron or nickel, in each of which the atoms appear to be very susceptible to magnetic influences, and to polarise very quickly, as shown by the way in which part of the disc is affected just before entering between the poles, as shown in the dark colour in the diagram marked 3.

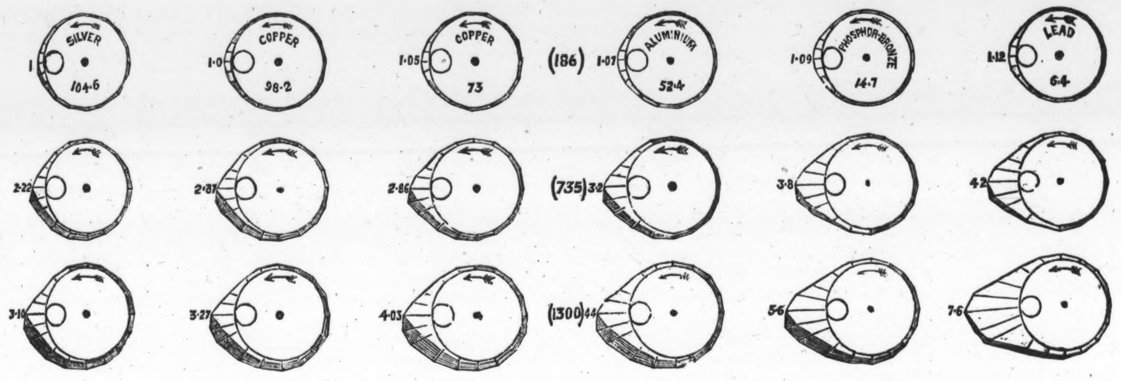


Fig. 2.

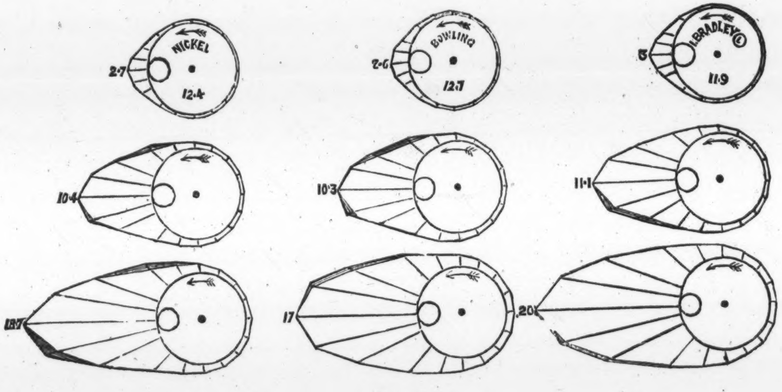


Fig. 3.

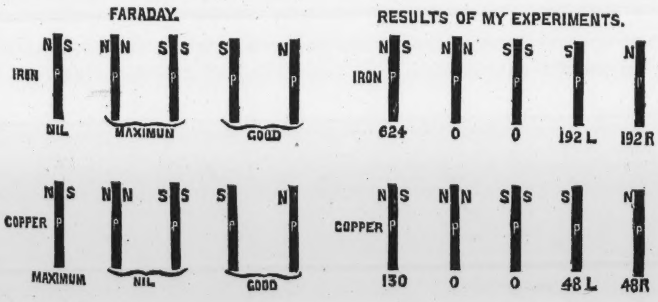


Fig. 4.

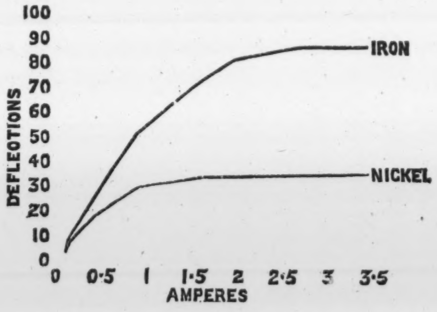


Fig. 5.

The atoms must as quickly depolarise, as you perceive there is but very little of what I have termed "drag" in those metals. The consequence of this is that with iron the amount of current is nearly in direct proportion to the speed of the disc, whereas with copper the increase is very small, the current produced by the two metals being as 1 to 7, at a speed of about 1,300 revolutions per minute. The higher the specific conductivity of the diamagnetic metal the greater the "drag," and consequently the less the current at the poles, this being more manifest at the high speeds, which does not, however, agree with the results obtained by Faraday, for he found that the currents were proportionate in strength to the conducting power of the bodies experimented with; or, in other words, that the higher the conductivity the greater the current; whereas I find the reverse to be the case, as shown on the diagram before you.

Faraday also obtained much better results from copper than from iron, and thus he recommended copper for his new magneto-electric machine. Here, again, my results do not agree with his, for I find that iron gives much better results than copper, as shown on the diagram, and also that iron has the great advantage that the current increases almost in direct proportion to the speed, whereas copper does not; in fact, as already stated, a speed might be obtained at which copper would give *no* current.

Faraday, in summing up the results of his experiments on Arago's phenomenon, says, "Nothing can be more clear, therefore, than that with iron and bodies admitting of ordinary magnetic induction, opposite poles on opposite sides of the edge of the plate neutralise each other's effects, while similar poles exalt the action. But with copper and substances not sensible to ordinary magnetic impressions, *similar* poles on opposite sides of the plate neutralise each other, and opposite poles exalt the action." Perhaps you will more readily grasp the subject by reference to the diagram marked 4, in which P represents the plates of metal, and the other letters the respective poles of the magnet and their position. Here, again, it will be seen that the results obtained by me are opposed to those given by Faraday. I have given the actual figures obtained in my experiments, and it will be seen that the only difference between the metals copper and iron is, that iron gives the higher current of the two, as it has done in all my experiments.

I have no doubt but that we should be able to get approximately near for all practical purposes to the relative conductivity of metals by revolving discs of the metal under test in a magnetic field, and measuring the amount of current between the poles or the amount of "drag." The results given on diagram 5 show how suitable the method also is for obtaining the saturation point of the cores of electro-magnets, whether of different qualities of iron or other magnetic metals.

Very recently an Electrical Congress held in Paris agreed to an universal system of electrical units. I believe the value of some of the units to be adopted was determined by passing masses of metal at varying velocity through a magnetic field of uniform intensity and noting the amount of current so produced. I understand that the results obtained by different experimenters did not agree, and from what I have shown you this evening you will readily understand the reason of the discrepancy. To obtain accurate results the influence of what I have called "drag" must certainly be taken into the calculations as an important factor.

## ELECTRO-MOTORS.

ALTHOUGH the technical journals in this country and abroad have frequently published paragraphs and descriptive illustrated articles on the telpherage system of Prof. Jenkin, we do not think it has yet been generally mentioned that the telpher lines supplied to South America and that for the Royal Agricultural Society's Show at Shrewsbury are worked in connection with the electro-motors designed by Mr. A. Reckenzaun.

We understand that Mr. Mylne of the Telpherage Company, representing Prof. Jenkin, has recently made some tests with a motor employed on the telpher line at Weston.

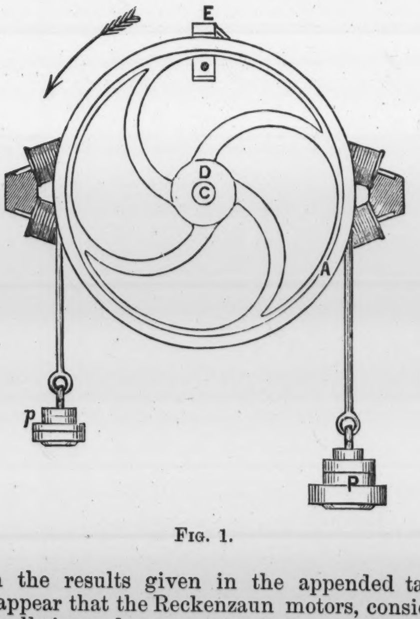


FIG. 1.

From the results given in the appended table it would appear that the Reckenzaun motors, considering their small size and comparative lightness, show a very fair efficiency. We are assured that there is not the slightest sparking at the commutator brushes, no matter at what speed the motor is revolving or even with the sudden and frequent reversals of current required in Prof. Jenkin's system.

These machines are provided with reversing gear, and weigh, complete, 117 lbs.; they will work continuously up to 1·5 brake horse-power, or, intermittently, to as much as 2 horse-power. Their dimensions are 16 inches long, 16 inches wide, and 8½ inches high; the resistance of the armature is 0·455 ohms and that of the field-magnets 0·090, giving a total resistance of 0·545 ohms between terminals.

The power tests were made by Prof. Jenkin's own dynamometer, the construction of which may be gathered from the sketches. It consists of a cast-iron V grooved pulley fixed on a shaft, C, by means of an American chuck, D, in order that it may be fitted to spindles of various diameters. A loose wooden pulley, B, having a well-lubricated gun-metal boss, is threaded upon the motor spindle, C. The cord passing over the upper quarter of the circumference of the wooden pulley, B, is fastened by an eye, S, and carries the smaller weights, *p*. Another cord held by the bracket, E, which is fixed to the loose pulley passes over a quarter circumference of the iron (fast) pulley, A, and this cord with weights, P, determines the work absorbed by friction; the circumference of cord in this case = 3·09 feet.

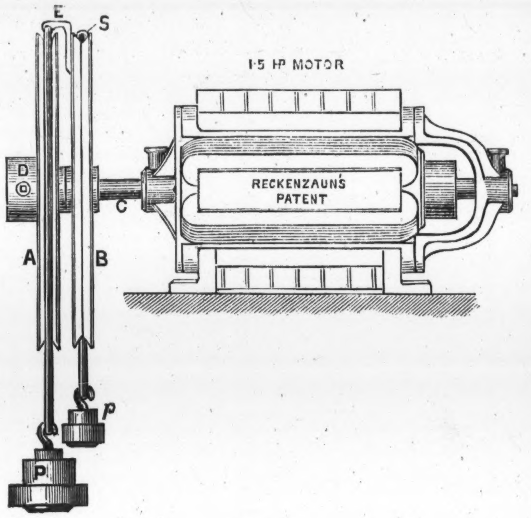


FIG. 2.

By adding or removing weights on either cord the speed or power can be varied. An advantage which this dynamometer has over the Prony brake is in the fact that no soap and water lubrication is required. The following table shows a few of the tests:—

| Rev. per min. | P—*p* lbs. | H.P. dynamometer. | Current ampères. | E.M.F. volts. |
|---|---|---|---|---|
| 2244 | 8·25 | 1·73 | 29·8 | 75·8 |
| 1984 | 8·25 | 1·53 | 29·4 | 69·9 |
| 1784 | 12·25 | 2·04 | 41·7 | 72·5 |
| 1300 | 9·5 | 1·15 | 31·5 | 52·3 |
| 996 | 9·75 | ·91 | 31·9 | 60·1 |
| 548 | 11·75 | ·60 | 36·5 | 37·3 |
| 428 | 11·25 | ·45 | 35·2 | 31·8 |

$$\text{H.P.} = \frac{3{\cdot}09 \times \text{revolutions} \times (\text{P} - p)}{33000}.$$

Do any of our readers know of an electro-motor weighing less than 160 lbs., giving the same power and efficiency as the apparatus to which we have referred?

We may mention that these motors are manufactured by the Electrical Power Storage Company, Mr. Reckenzaun being highly satisfied with their construction both mechanically and otherwise.

## THE ORGANISATION OF THE POST AND TELEGRAPH SERVICE IN FRANCE.

*(Continued from page 69.)*

*Telegraph Instruments.*—The electrical communications would have been naturally insufficient, if the use of improved instruments had not checked the excessive cost, which would have resulted from the erection of an indefinite number of wires.

The working capacity of these wires, being considerably increased by the use of those same instruments, it has placed at our disposal certain of the existing wires and decreased the number of those which we otherwise would have been obliged to erect.

These disengaged wires thus supply to the service very useful additional means to work the intermediate stations and to satisfy the special wants of the Press, the Stock Exchange, &c. The system thus gains a reserve, which provides against any unforeseen or accidental changes in the telegraphic transit.

Telegraph instruments should transmit signals in an accurate and regular manner, from the sender to the receiver; it is very desirable that those signals should leave a record, to avoid mistakes, inseparable from a reading which cannot be checked, and to point out precisely who is responsible.

These considerations have determined us to replace the needle instruments by Morse instruments; and on lines, where the traffic justified it, the Morse, by simple Hughes, or by Morse connected up to work duplex; finally, these two last systems, by rapid senders, such as the Meyer, Wheatstone, Baudot.

The needle instrument is one of the simplest apparatus; it is still being worked in a large number of railway stations; clerks easily learn to work it, but the handling is slow, and the transmitted messages do not leave any record. The Administration therefore decided that it should be replaced by Morse instruments in all the amalgamated offices, and the number of needle instruments, used on the telegraph system of the State, which in 1876 amounted to 1,247 has come down to 633, on the 1st July, 1883.

*Morse Instrument.*—From the very beginning of electrical telegraphy it has been the aim to discover a system which would allow of keeping a record of the signals. This problem has been solved in a very simple manner by Morse, whose instruments are being used on all the smaller lines.

The average speed is from 20 to 30 messages, or say 400 to 600 words, per hour.

The number of Morse instruments used in France amounted in 1876 to 3,853; this has successively been increased in 1877 to 4,148; in 1878 to 5,348, and on the 30th June, 1883, it reached 7,702.

Experiments made in the workshops of the central depot in Paris, have enabled us to make certain alterations in the Morse receivers, so as to simplify their construction and to improve their working. By applying the duplex system to the Morse instruments (simultaneous transmission in opposite direction), a speed from 20 to 45 messages per hour may be obtained. One wire is at present working duplex.

The reason that this latter system has not been extended to a larger number of lines, as in England, is that the Hughes instrument, the speed of which is greater, does at present service on 275 of our busiest wires. Besides, it is only because of the insufficient speed of the Morse and sounder, that the English Administration has been obliged to increase the duplex installations.

*Hughes Instrument.*—The Hughes, besides its greater speed, which is from 40 to 60 messages, or 800 to 1200 words, per hour, has the further advantage of producing the messages, printed in typographical letters, and thus to allow of their being checked. It is therefore used on lines which are constantly at work; the number of messages per day forwarded over those lines varies between 250 and 500. The number of Hughes instruments used in France, which on the 1st January, 1878, amounted to 314, has successively been increased, on the 1st January, 1879, to 332; on the 1st January, 1882, to 502; on the 1st January, 1883, to 526. It reached 586 on the 1st January, 1884.

Some excellent modifications have been introduced in the mechanism and in the electrical connections of this instrument, two of which were effected by officials of the French Administration (Messrs. Terral and Mandroux). A telegraph clerk, M. Humblot, has succeeded in substituting for the weight, which drives the mechanism of the Hughes instrument, a hydraulic motor of his invention, which gives very good results. Owing to this innovation the working of the instrument is less troublesome and more accessible to female operators.

*Wheatstone Instrument.*—The Wheatstone, which obtains a speed of 100 messages (say 2,000 words) per hour, is worked on four of our most important lines. It transmits automatically messages which have first been produced on a perforated paper slip. The speed with which signals are transmitted is very much increased by the successive sending of currents in opposite direction.

A royalty of 1,250 francs per instrument was till recently paid to the heirs of the inventor; but this royalty ceased on the 10th March, 1883, on which day the patent expired.

The number of our Wheatstone instruments, which amounted to 4 in 1876, was 8 on the 1st January, 1884.

*Meyer Instrument.*—M. Meyer, an official of our Administration, has invented an instrument which, owing to an ingenious distribution of time and labour, places one and the same line successively in communication with four or six different keys, thus allowing of the transmission, at the same time, of four or even six messages.

This instrument obtains a speed of 75 messages or 1,500 words per hour in the first case.

The application of the Meyer instrument for the simultaneous transmission to three stations on the same wire has met with the greatest success between Paris, Caen and Cherbourg.

*Baudot Instrument.*—The multiple and printing instrument invented by another official of the telegraphs, M. Baudot, who has received a diploma of honour, at the International Electrical Exhibition in Paris. and who had already received the large gold medal and the Cross of the Legion of Honour, at the Universal Exhibition of 1878, has, on our busiest lines, attained a speed of nearly 200 messages, or 4,000 words, per hour.

The time occupied by a signal to travel over the longest overhead wires, is so small that a long time is lost between two consecutive signals of one and the same instrument. This interval may thus be filled up, by the signals of other instruments, and it appears that there is no other obstacle to this multiplication of messages, by dividing the time, but the duration itself of the generation of electricity.

It is on this principle that M. Baudot has constructed his instrument, which transmits simultaneously six messages with a speed which exceeds that of all the other systems used in France. Besides, owing to an ingenious arrangement called "The Combiner," the receiving instrument prints the messages in typographical letters.

This instrument, after having been submitted to important alterations, is at present working in Paris, on a line with each of the towns of Lyons, Marseilles, Bordeaux, Havre, Brest, and Lille, and on the lines from Bordeaux to Marseilles and from Lyons to Marseilles. Moreover, an installation of the duplex Baudot has been used on one of the two wires from Paris to Bordeaux, and also from Bordeaux to Toulouse, and from Marseilles to Nice. The results obtained are excellent, and this system is now rapidly becoming general.

We also hope that the same manner of transmission may soon be extended to certain international lines.

The Administration has, conjointly with the inventor, entered into a lawsuit, referring to this instrument, against a former official of the Administration who, under the pretext of having invented a similar instrument, attacked M. Baudot for infringement; this official, notwithstanding the assistance which the Administration had offered to him to construct his instrument, had never shown it in a finished state.

The Courts of Paris, by judgment of the 7th May, 1880, have decided in favour both of the Administration and of M. Baudot, and have refused the claim of the defendant.

The Court of Appeal has admitted the appeal against this judgment, and has referred the suit to the Courts of Amiens.

The case will therefore be tried again before that court.

Experiments have been made with the idea of adopting the same kind of transmission, suitably modified, on the submarine cables which connect us with Algiers; favourable results may be expected.

Up till now, the special conditions under which submarine cables of great length are worked, compelled the use of special instruments, such as the mirror, but this latter possesses the inconvenience of being troublesome in the working, very sensitive and little trustworthy, the signals being produced by the oscillation of a luminous ray, in a dark room, where the clerk is constantly on duty.

This instrument has been replaced by the syphon recorder, the principle of which is similar, but which possesses the advantage of leaving a record of the oscillations which produce the signals.

*(To be continued.)*

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**Telegraphic Money Orders.**—With reference to the statement to the effect that the Indian Post Office is about to introduce the telegraphic money order at a charge of 1 per cent., plus the cost of telegram, Kenric B. Murray, F.R.G.S., F.S.S., writes to a daily paper, remarking that no such system exists as yet in this country, although the British postal services produce a profit of over three millions sterling annually. This surplus proves that the Post Office disposes of quite sufficient funds to enable it to introduce a new service should it be proved that the necessity exists for its creation. He continues:—"I understand that the Postal Department has several times made inquiries into the possibility of organising such a service for the United Kingdom, and no favourable decision appears to have been arrived at up to the present. I trust that the knowledge of the fact that one of the dependencies of this kingdom will shortly possess one considerable postal facility more than the mother country is able to give, will bring sufficient logical pressure to bear upon the Post Office and Treasury as to induce them to get over whatever technical difficulties may lie in the way by the creation of a service which, as all travellers are aware, has for a number of years past been in active operation in nearly all European States."

## NOTES.

**Electric Lighting.**—We understand that the Board of Trade has decided to proceed at once to revoke no fewer than 25 of the provisional orders granted last year for the electric lighting of London and its suburbs. Of this number, 23 are orders which were obtained by the Metropolitan Brush Electric Light and Power Company, which has since gone into liquidation. These orders relate to the electric lighting of Barnes and Mortlake, Bermondsey, Chelsea, Chiswick, Clerkenwell, Finchley, Greenwich, Hackney, Holborn, Hornsey, Islington, Limehouse, Poplar, Rotherhithe, St. George-in-the-East, St. George-the-Martyr, portions of the parish of St. Giles, the parishes of St. Luke's, St. Olave, St. Saviour's, Southwark, Shoreditch, Whitechapel, and an order known as the Wandsworth order, which, howover, relates to portions only of the parish of Clapham. Of the other two orders which will be revoked, one relates to the lighting of Kensington, and the other is an order granted to the Pilsen-Joel Electric Lighting Company with powers to light those portions of the parish of St. Giles not granted to the Metropolitan Brush Company. So far as London is concerned, the result, therefore, of the numerous electric lighting orders which have been granted during the past two years is, that only eight now remain in force, namely, the St. James's and St. Martin's order, which, with the Hanover Square, Strand, and Victoria district orders, are now held by the Edison and Swan United Electric Lighting Company; the Hampstead order, granted to the Hampstead Electric Lighting Company; the St. Pancras order, granted to the vestry; the order for the lighting of Fulham, which was granted only last May to the West Middlesex Electric Lighting Company; and the order, also granted in May last, to the West London Electric Lighting Company, for lighting portions of the parishes of St. George's, Hanover Square, St. James's, Westminster, and St. Martin's-in-the-Fields. Of these eight orders, the first five have already had their time extended within which to comply with the provisions of the orders, and unless these provisions are complied with before the 15th October next, the powers will be lost unless a further extension of time is granted.

When English investors embarked in the electric lighting enterprise, the *Statist* writes, the justification of their venture was a general belief in the advent of an era of electrical development. Telegraphs and telephones were known to have yielded excellent financial results to their pioneers; and the rank and file of the proprietary have fared, on the whole, exceedingly well. This being so, it might fairly be inferred that, given good administration and some legislative assistance, the new industry would meet with similar success. This view, for which there was much to be said, was crystallised in the public mind by the Exhibitions held in Paris and at Sydenham. With their own eyes the public saw the new light—under exceptionally favourable circumstances, it is true. Having seen the light, they were confirmed in the truth of the assumption that electric lighting was not only in a promising stage of the invention, but that it was ripe for treatment in Parliament by way of restriction and penalty. Accordingly a bill was introduced by Mr. Chamberlain, which in August, 1882, received the Royal Assent. Under the conditions of this Act, it was provided that no electric lighting station should be laid down except under such restrictions as would prevail in the case of a gas enterprise; and, furthermore, that the undertakers should in no case enjoy the monopoly for a longer period than 21 years. The direct consequence of these provisions is, that not a single company has hitherto begun operations under a provisional order, and we venture to prophecy that, under the Act as it stands, no board of directors will incur the responsibility of spending one shilling for that purpose. The only inference from this is, that the Act has not only failed to redeem the promise expressed in the title, *i.e.*, an Act to *facilitate* electric lighting, but it has actually strangled in the moment of birth the electrical infant.

At the twenty-third annual meeting of the members of the North British Association of Gas Managers, held at Glasgow, on the 24th July, Mr. F. T. Linton, Edinburgh, president, in the course of his inaugural address to the meeting, said:—How far other sources, and notably electricity, might come into use as competitors for illuminating purposes with coal gas they need not discuss. The hard logic of facts had shown how impossible in present circumstances it was for electric lighting to compete commercially with gas, and it was difficult to conceive any probability of those circumstances being materially altered. Meanwhile they, as humble fellow-workers in the same field of adapting the forces of nature to the use and benefit of mankind, might well express their unfeigned admiration for that most beautiful and striking example of it which the genius and patient labour of many eminent men had produced in the various firms of electric lighting, and especially in the incandescent lamp. They had no jealousy of the electric light. They wished it every success in the many special uses to which it was admirably adapted. They did regret, however, that, owing to the action of unprincipled speculators, and, it must be added, to the way in which the public press in too many instances lent itself to the publication of extravagant and misleading statements, the the legitimate extension of the use of electric lighting had been hindered for probably many years, and the money of a number of credulous persons, to the extent of millions of pounds, absolutely squandered. It seemed to him that gas manufacturers, who were threatened, somewhat jubilantly on the part of some people, with total extinction by electric lighting, were, after all, those whom it had chiefly benefited. They must confess that it was largely due to the threatened competition by electric lighting that their profession had been thoroughly roused from a condition of use and wont to one of activity and progress, and that spirit of inquiry induced which had already led to such beneficial results.

At a recent meeting of the Lighting Committee of the Hull Corporation, the Town Clerk reported that on the 10th July, the Council passed a resolution rescinding the contract with Messrs. Siemens for lighting the Old Town with electricity from the 28th July. He had given the necessary notice to Messrs. Siemens, and requested them to make arrangements for removing all their plant and machinery. Mr. Grindell said that although the light with which Hull had been supplied had not been a great success, still they ought to take immediate steps for its continuance by some other firm. Instructions were given to the borough engineer to obtain tenders for, and to report to this committee on, the best means of lighting the public lamps and the Town Hall within the area at present lighted with or without electricity.

The Consolidated Electric Company has just made an addition to its exhibit at the International Health Exhibition in the shape of a set of carriage accumulators, constructed to slide under the coachman's seat. The apparatus consists of five ebonite cells, made quite tight, so that no acid can escape when the carriage moves. The cells, which are 9 in. high, 9 in. deep, and 4¼ in. wide, each contain three positive and four negative plates, made on the B.T.K. system. They are neatly fitted into a well made mahogany frame, and the P and N. poles are marked. This little accumulator will light three lamps of 5-C.P. for five or six hours, and it is believed to be the smallest and most effective for its size of any secondary battery in the market. The frame, with cells complete, measures just 2 ft. in length.

Some experiments were made in the Queen's College, Belfast, on Saturday, in connection with the illumination of the entire college building with the electric light during the sittings of the British Medical Association. The experiments were highly successful.

General Duane has, since August last, been carrying out a series of experiments at Tompkinsville, Staten Island, as to the applicability of electric lights for lighthouse work for the United States Lighthouse Board. The present result of the experiment is that the electric light is found to be ten times more powerful than the oil light, and that for a given amount of light it is the cheaper of the two. It is said that of the apparatus tried the most useful has been found to be that at present in use in the French lighthouses. Among the dynamos tried have been the Gramme, Elphinstone-Vincent, Siemens, and Weston. The report on these experiments is not expected to be ready for some months yet.

Among the exhibits of domestic electric lighting at the International Health Exhibition, by no means the least interesting are those of Mr. T. Tayler Smith, of 4, Circus Place, London Wall, E.C., who has published a pamphlet containing notes on domestic lighting, in which he describes the special character of his fittings. These are for the purpose of giving increased facilities for placing incandescent lamps in any required spot or position, so that a householder, while using a limited number of lamps and paying only for a limited current, can obtain all the advantages of a large current, without incurring the expense and waste which would be usually attendant thereon. For this purpose, the brackets and fittings are provided with hooked projections of peculiar and uniform pattern, so as to be interchangeable; and around the skirting boards, and in the walls, and other places in the rooms, where lights are likely to be needed, a number of spring terminals, protected from touch and almost concealed from sight, are fixed or embedded. These spring terminals are also of uniform pattern and construction, and constitute so many separate points of attachment for the hooked projections on the lamp brackets or other fittings. By this system of removable and interchangeable fittings a material saving in the cost of working plant is said to be effected. To prevent fraud, a fusible safety plug accessible only by the company, controls the current admitted to the house, and should a number of lamps in excess of that agreed upon be lighted at any one time by the householder, the plug will be fused, and the current entirely cut off. In order that the public may be able to judge of the practicability of the method alluded to, a series of rooms have been erected at the International Health Exhibition, wherein the various movable fittings can be seen in use.

**The Post Office and the Telephone Companies.**—Mr. Jacob Bright asked the Postmaster-General, in the House of Commons on Thursday, the 24th ult., when he would be able to return an answer to the telephone companies in regard to matters in discussion between them and the Post Office department. Mr. Fawcett: The United Telephone Company and its affiliated companies have submitted to me three different proposals, the consideration of which involves many complicated and difficult details, and I am sure it is of great importance that these proposals should be carefully considered in all their bearings. I have personally devoted all the time to their investigation I could spare, but have not yet been able to complete it. I may add that from four other licensed companies I have not received any statement, but I have informed them that if they do not at once furnish me with one I must decide without having their views before me. Although I cannot fix the precise day, I can but repeat the promise that there shall be no unnecessary delay, and I can assure my hon. friend that no one can be more anxious than I am that the question should be speedily settled. (Hear, hear.) Mr. Gray asked whether the right hon. gentleman expected that his decision would be pronounced before the Post Office Estimates were taken. Mr. Fawcett said he felt, in the interest not only of the Post Office and the public, but of the companies themselves, that his decision should not be a hasty one. He would not wish, therefore, to give a pledge as to a particular day. Mr. Gray said that on Monday he would ask the Prime Minister whether he was aware that the question in dispute was as to the right of that House and the Government overriding a legal decision.

In answer to Mr. Gray, in the House of Commons on Tuesday, Mr. Gladstone said: I find that it is true that a certain clause in the Telegraph Bill of the late Government was disagreed to by the House of Commons. Objection has been taken to the sufficiency of the present law. The hon. gentleman asks me whether a legal decision was not obtained by the Department on a technical point. According to the advice which the Government have received the judgment was by no means on a technical point, but upon a substantial matter, and it was to the effect that the Crown was in possession of a certain right by the existing law. That being so, it was the absolute duty of the Department to assert that right. But with regard to the last paragraph of the question, whether "since that date the Post Office had levied a tax upon the use of the telephone, and had imposed constantly increasing restrictions eventually amounting to practical prohibition of its use for exchange purposes," I am not prepared to say what the proper decision to arrive at may be, but the Postmaster-General is seriously engaged in considering whether he can, in justice to the Crown and the country, introduce relaxations into the rules now in force.

**The Telephone and Fires.**—Commenting upon the paragraph which appeared in a recent issue of this journal, stating that the news of the outbreak of fire at the Theatre Royal, Edinburgh, was received by means of the telephone at the central fire station within a few minutes of the first alarm, the *Electrical Review* of New York says:—"And it may likewise be mentioned that, in any American city of reasonable size, every fire engine house is informed of every fire, and of its approximate location, within *two seconds* of the first alarm. There is a wide field for the introduction of the fire alarm telegraph in England, if our London namesake is correct in its statements."

**Overhead Wires.**—Sir H. Tyler, on Thursday, the 24th ult., asked the Secretary to the Local Government Board whether he was aware of the number of wires now stretched overhead in various portions of the metropolis, of which about 230 might be counted between the Royal Exchange and St. Michael's Church, Cornhill, and about 200 between the Mansion House and Queen Street, over Queen Victoria Street; and whether, having regard to the danger thus occasioned to persons using the streets, especially in thunderstorms, snowstorms, and high winds, he would consider whether the time had arrived when some steps should be taken to deal with this question. Mr. G. Russell: We are aware that there is a large number of wires stretched overhead in the metropolis, and have no reason to doubt the statement as to the number of such wires in the localities mentioned. In replying to the hon. member for East Aberdeenshire, I stated that we would consider whether a select committee shall not be moved for next session, for the purpose of inquiry and report on the subject. Only six out of the 230 belong to the Post Office, and only four out of the 200.

**Ambulance Experiments at Aldershot.**—Some very interesting experiments were conducted on Thursday night, July 24th, with a travelling electric arc light as applied to ambulance service in the field. The electrical details were superintended by Messrs. Woodhouse and Rawson.

**Proposed Telegraph Consolidation in America.**—Persons interested in bringing about a consolidation of the Baltimore and Ohio, the Postal, and the Bankers' and Merchants' Telegraph companies have held frequent conferences, but no definite plan has yet been agreed upon.

**Atlantic Cables.**—In another column will be found the report of the directors of the Anglo-American Telegraph Company, which contains a remark respecting the Commercial Cable Company, and its chances of success. A daily financial paper has taken the board of the Anglo-American Company rather severely to task for having gone out of its way to insinuate that Messrs. Bennett and Mackay's enterprise had no reasonable prospect of making a profit; our contemporary, at the same time, goes rather deeply into the question of the market value of the property of the Anglo-American Company, whose four cables it estimates to be worth £1,656,813; and it continues to remark that even if the two cables of the Commercial Company should cost £1,500,000, as officers of the present companies declare they will do, all told, the comparison is not wholly unfavourable to the new cables, considering that they are the latest fruits of the development of science in cable construction and cable laying.

**Post Office Telegraphy.**—Regarding the report of the Postmaster-General just issued, the *Times* says:—The increase in the gross telegraph revenue in the past year is not nearly so great as that of the preceding 12 months, probably a much surer index of the state of trade than the increase or decrease of correspondence. The *minimum* price of a telegram at present is such as to preclude its use for private purposes by any but the well-to-do classes, and even in business matters the telegraph is probably placed out of the habitual use of retail tradesmen. The promised reduction of the tariff will be a change of a far-reaching character, and it will be interesting to note its effects. In the meantime communication by means of the telephone is increasing in large towns and business circles, although here again, as the instrument is at present worked, only the upper middle class can participate in the advantages of the invention. The Postmaster-General calls attention to the fact that by far the larger part of the telephonic communication of the country is at present supplied by private companies holding his licence.

**Telegraph Supervision.**—In answer to Colonel King-Harman, in the House of Commons on Monday, Mr. Fawcett said he would inquire whether it would be better to appoint female supervisors on the Dublin telegraph staff.

**Telegraphic Instrument in the House of Commons.**—Mr. Gray asked the First Commissioner of Works, last week, if he had yet come to a decision whether he would allow a telegraphic news-recording instrument to be erected in the House for the use of members. Mr. S. Lefevre said he had consulted with the Sergeant-at-Arms, who was of opinion that the proposal of the hon. member did not offer any facilities above the present system under which the telegraphic news to the House was supplied gratis.

**Telegraph Revenue.**—The telegraph service yielded £590,000 in the period from the 1st April to the 28th July, 1883; this year, between 1st April and 26th July, the receipts have amounted to £520,000.

**Patents Act, 1883.**—The Board of Trade, with the consent of the Treasury, has made the following reduction relating to certain fees prescribed by the second schedule of the Patents, Designs, and Trade Marks Act, 1883:—In the case of patents granted before the commencement of the said Act, a patentee who has paid the prescribed fee of £50 before the end of four years from the date of his patent may, in lieu of the prescribed fee of £100 payable before the end of seven years from such date, pay the following annual fees:—Before the end of the 7th year from the date of the patent, £10; 8th, £10; 9th, £10; 10th, £15; 11th, £15; 12th, £20; 13th, £20. This reduction came into operation on August 1st.

**Meteorological Observations in Australia.**—We have received a copy of the report of Mr. Charles Todd, C.M.G., F.R.A.S., Observer, Postmaster-General, and Superintendent of Telegraphs for South Australia, of the meteorological observations made at the Adelaide Observatory, and other places in South Australia and the northern territory, during the year 1881. A mass of information respecting the rainfall and atmospherical phenomena at the various stations is given, which would no doubt prove very interesting to those engaged in similar observations in this country.

**Metcalfe v. London and Globe Telephone Company, Limited.**—This was a motion, heard before Mr. Justice Pearson on Thursday, to restrain the board of the defendant company from giving effect to an agreement dated June 24th, by which the property of the company was to be handed over to the United Telephone Company. The plaintiff is a shareholder of the London and Globe Company, and moved upon the ground that the meeting at which the agreement was presented for ratification was irregularly held and conducted. It appeared that, certain shareholders being dissatisfied with the explanations given respecting the agreement, a motion was put and carried for the adjournment of the meeting, in order that further and more definite information might be given. A poll, however, was demanded and taken, reversing the effect of the resolution. It was as to the regularity of this course that the learned judge had to decide, and after hearing evidence, he stated that he had come to the conclusion that the meeting was held in a proper and regular manner, and that the poll was properly demanded and taken. Therefore, he dismissed the action with costs.

**Miners' Safety Lamp.**—The adjudicators for the prize of £500, offered by Mr. Ellis Lever for a new safety lamp, have now reported as follows:—Ellis Lever Competition.—The adjudicators had to examine 108 lamps; of these four were electric lamps, and 104 oil lamps, of which a few were designed to burn mineral oils. With respect to the electric lamps, there was not one which fulfilled, or approached fulfilment of, the conditions of the award. All the lamps which fulfilled the preliminary requirements were submitted to a series of experiments of progressively increasing severity. These experiments, based upon the experience gained by the Royal Commission, and by experiments instituted by other bodies in this country, were calculated to fulfil even exceptional conditions to which lamps may be exposed in actual practice. While there was a considerable number of lamps which behaved satisfactorily under the normal conditions existing in mine workings, the number was reduced to very few as the extreme tests were reached. Of these there is no one lamp that perfectly fulfils the whole of the conditions enumerated in No. 2, and the adjudicators are consequently unable to make the award to any one of the lamps submitted. Among the best there are two which the adjudicators regard as deserving of special mention, viz., the Marsaut lamp, with three gauzes, which most nearly fulfilled the conditions; and the lamp of Mr. William Morgan, of Pontypridd, South Wales, which presents several good features of marked originality.—Thos. Burt, F. A. Abel, W. Grylls Adams, Silvanus P. Thompson.

As a lamp meeting the requirements necessary has not been invented, the £500 reverts back to Mr. Ellis Lever.

**Underground Wires in America.**—In reference to the Bill passed in New York for the placing of all telegraph and similar wires underground, the *Electrician* of New York says: "The practical confiscation or destruction of this property, as it stands to-day, by a single blow without compensation, can be considered nothing less than an unparalleled outrage." It also says, in allusion to the vague terms in which the Bill is framed, "the poles and wires now standing in the streets of New York and Brooklyn have been placed there under the provisions of, and in compliance with, existing statutes, and, inasmuch as the new Bill makes no provision for repealing previous legislation on the subject, there seems to be no reason why electrical companies may not proceed with their overhead construction as heretofore; there would seem to be nothing to prevent their doing so, at least, until November 1st, 1885."

**Electric Bell Fitting.**—The new Thompson Memorial Home at Lisburn, near Belfast, one of the largest hospitals in Ireland, is now being fitted with a thorough electric bell communication. This will be one of the most complete and extensive electric bell arrangements in the country. The work is being carried out by Mr. C. MacCarthy, who was electrician to the late American Telephone Company, Rotterdam, and who has now taken offices in Queen's Buildings, Royal Avenue, Belfast.

**Torpedoes.**—The Admiralty is giving increased attention to the importance of torpedoes in naval warfare, and have just issued an order for the purpose of securing uniformity in the arrangements of all torpedo fittings and electric apparatus in Her Majesty's ships. As the only place possessing torpedo schools ashore as well as afloat and an electrical workshop and a staff of officers, Portsmouth has been very properly converted into the head-quarters for the torpedo branch of the service. The dockyard officers at Portsmouth are to confer with the captain of the *Vernon* on all questions relating to changes of existing patterns and to the introduction of fittings for new classes of ships and boats, and once every week the latter is instructed to attend the *levée* of the Admiral-Superintendent for the purpose of considering any matter which may arise in relation to torpedo and electric fittings. It is also ordered that the position of all electric batteries and machines, projectors, and directors, and the stowage of torpedo stores, &c., are to be arranged in consultation with an officer from the department of the Director of Naval Ordnance, the fittings being carried out by the dockyard.

**Thunderstorms.**—On Thursday week thunderstorms were experienced in England and Scotland. At Nottingham the storm was not so severe as some of those recently experienced. James Harris, a milkman, was selling milk to some men employed upon a new sewer at the east end of the town, when he was struck by lightning, which set fire to his hair, and passed down the left side of his body, causing instant death. In Scotland the storms were accompanied by hail showers, the stones being large. At Kelso the lightning struck a tree near Floors Castle; smoke issued from the trunk for a considerable time after the occurrence. The same tree was similarly injured three or four years ago. At Arbroath, the tower of a memorial chapel in course of erection was struck, the lightning passing down to the pavement, a dark coloured streak marking its path. Two men were rendered insensible, and a third temporarily lost the power of one of his hands. On Saturday morning, the corning-house of the Blackbeck Gunpowder Factory, belonging to Messrs. Dickson and Company, situated near Haverthwaite, about three miles from Lake Windermere, was struck by lightning and destroyed. There were four men working in the house, three of whom were instantly killed, and the fourth badly burnt. It was the only flash seen, so the unfortunate men had not time to leave their house as they always do during a thunderstorm in all powder factories. On the farm of Millburn, Ythan Wells, Insch., after the thunderstorm of Wednesday week, a portion of a field of oats was observed to have suddenly assumed a white or yellow hue, but it was not closely inspected till Sunday, when it was discovered that the place had been struck by lightning. In the centre of the spot where the lightning had struck, the ground is ploughed to an average depth of a foot, and from 1 ft. to 1½ ft. in width, first (from the south) about 3 yards, then an interval of about 4 yards, and finally the furrow is renewed to the extent of about 5 yards. The tops of the blades of oats around are scorched over a large irregular square of 30 yards by 40 yards.

**New York Electrical Society.**—At a recent meeting of this society, Dr. N. S. Keith pointed out that the number and extent of ærial wires in New York had been largely overstated. On reliable authority he found that the telephone companies had about 6,000 or 7,000 miles, the Western Union about 3,000, and the other companies in proportion. Dr. Keith also drew a plan of a new project for underground conduits and a tunnel under Broadway, in connection with a projected electric railway. The society adjourned to meet again on the second Wednesday in October.

**Personal.**—We are informed that Mr. Harry South, who till recently was connected with the Hammond Electric Light and Power Supply Company, and who carried out on their behalf several of their most important installations, has taken offices at No. 169, Queen Victoria Street, E.C., and commenced business as an engineer and electric light contractor.

Mr. J. S. Beeman has just severed his connection with the South Eastern Brush Electric Light Company, and is about commencing business on his own account in general engineering work, making electrical subjects a special branch of his profession.

Mr. James P. Maginnis, M.I.M.E., well-known through his improvements in drawing instruments, has recently resigned the chief draughtmanship of the Institution of Mechanical Engineers, and has commenced business as an engineer and draughtsman at 23, Queen Anne's Gate, Westminster. He has had a considerable experience—about eleven years—in practical engineering.

## NEW COMPANY REGISTERED.

**Indo-European (London to Bombay) Railways Company, Limited.**—Capital £10,000,000 in £20 shares with power to increase to £35,000,000. Objects: To construct and work railway, telegraphic, telephonic, electric or other communication in Morocco, Algeria, Tunis, Tripoli, Egypt, Turkey, Persia, India and elsewhere. Signatories (with one share each): G. Davis, 80, Coleman Street; S. Cocker, 46, Southampton Buildings; H. J. Newell, 43, Camberwell New Road; H. B. Worrell, 80, Coleman Street; E. T. Collis, 70, Cloudesley Road, N.; R. A. Henderson, 91, Edgware Road; R. S. Tomlin, 2, Poet's Corner. The signatories are to appoint the first directors; qualification 25 shares; remuneration, £1,000 per annum to the president or chairman, £500 per annum to each vice-president or deputy chairman, and £300 per annum to each ordinary director. Mr. Jean Baptiste Bouville, of Paris, who has prepared plans and estimates for the construction of railways and telegraphs in the countries named, is appointed engineer in chief for seven years at a salary of £4,000 per annum. Registered 28th ult., by Davis & Co., 80, Coleman Street.

## OFFICIAL RETURNS OF ELECTRICAL COMPANIES.

**Deal and Walmer Electric Light Company.**—The statutory return of this company, made up to the 17th ult., was filed on the 25th ult. The nominal capital is £5,000 in £5 shares. Ninety-nine shares have been taken up, and 5s. per share has been called thereon. The calls paid amount to £24 15s. Registered office, 5, Clanwilliam Road, Victoria Town, Deal.

**Electrical Association, Limited.**—Mr. Alfred Ford, the liquidator of this company, has informed the Registrar of Joint Stock Companies that a meeting of the company was held on the 25th ult., at which an account was laid before the shareholders, showing the manner in which the winding-up of the company has been conducted, and the property disposed of.

# CITY NOTES, REPORTS, MEETINGS, &c.

## The Consolidated Telephone Construction and Maintenance Company, Limited.

THE adjourned ordinary general meeting of this company was held at the Cannon Street Hotel on Friday, the 25th ult., Mr. C. L. W. Fitzgerald presiding. It will be remembered that at the meeting held on the 23rd of May last the report of the directors was submitted, but its consideration was deferred pending the report of a committee of investigation appointed at that meeting, the committee consisting of Messrs. C. L. W. Fitzgerald, H. Grèwing and A. H. Baker (who were at the same meeting elected to vacancies on the board), J. Taylor and G. B. Howden. The report of that committee was now submitted, and was as follows:

"The promoter of the company was Mr. F. A. Gower. The original directors were Sir Julius Vogel, K.C.M.G.; Colonel Gouraud; Sir A. Armstrong, K.C.B.; Prof. Alexander Graham Bell; J. P. Bigelow, Esq.; P. Carnegy, Esq., C.I.E.; Sir W. Drake, K.C.B.; Thomas Alva Edison, Esq.; Frederick Allen Gower, Esq.; J. B. Morgan, Esq.; J. M. Ormes, Esq.

"The allotment of the shares took place on the 22nd April, 1881. There were—

| | | |
|---|---|---|
| 1,750 applications, representing ... | 846,877 | shares. |
| 483 allotments „ ... | 154,165 | „ |
| 1,267 refusals „ ... | 692,712 | „ |

"Amongst other peculiarities we find that—

| | |
|---|---|
| Sir Julius Vogel applied for 1,000 shares and was allotted 15,000, present holding ... ... | 625 |
| Colonel G. E. Gouraud applied for 5,000 shares and was allotted 15,000, present holding ... | 625 |
| Mr. Patrick Carnegy applied for 500 shares, and was allotted 2,500, present holding ... ... | 625 |
| Sir Alexander Armstrong applied for 6,000 shares, and was allotted 2,500, present holding | 625 |

"The capital of the company is £300,000, of which £200,000 was originally issued. Of this amount Mr. F. A. Gower received £91,660 in cash, and also £45,835 in shares. This would leave £62,500 for working capital. In May, 1883, a further issue of 50,000 shares took place at a discount. Of this issue 24,850 were taken, realising the amount of £19,164 7s. 6d. (the discount being £5,685 12s. 6d.), so that the directors have had through their hands the total sum of £81,664 7s. 6d. Perhaps it would not be out of place to see how this sum has been locked up.

"According to the figures of the report, March 31, 1884:—

| | £ | s. | d. |
|---|---|---|---|
| The River Plate Telephone Company owed | 28,442 | 13 | 5 |
| And you had invested in this company 1,000 shares at £5 per share ... | 5,000 | 0 | 0 |
| The Edison-Gower-Bell Telephone Company owed ... ... ... ... ... | 7,763 | 12 | 6 |
| And you had invested in this company 15,000 shares at £1 per share ... | 15,000 | 0 | 0 |
| The Austrian Concession Account stands at a debit of ... ... ... ... ... | 24,365 | 11 | 6 |
| Total ... ... | £80,571 | 17 | 5 |

"The next point of importance is, what did you receive for the £137,500 paid to Mr. Gower? Mr. Gower sold to the company his patent rights of the Gower-Bell Telephone for the whole world, except North America and France, and certain contracts for the manufacture and supply of telephones, the total number being 8,699. Of this number 3,507 was part of an unfinished contract for 5,000 with the Postmaster-General: sundry smaller contracts which have been completed, with one exception; and, lastly, a contract for 4,000 Gower-Bell telephones, signed by Colonel G. E. Gouraud, and Messrs. J. P. Bigelow and W. W. Cargill. The said three gentlemen purchased these 4,000 telephones in consideration of a transfer to them of all the Gower-Bell patents for India, Ceylon, the Straits Settlements, Java, China, Japan, South Africa, Australia, New Zealand, Egypt, Turkey, Greece, Malta, and the Hawaian Islands. This contract, dated the 8th March, 1881, has never been completed. On the 11th August, 1881, Colonel G. E. Gouraud retired from the board.

"On October 7, 1881, it seems that the board grew uneasy about the non-completion of this contract for 4,000 telephones, and from that date until July 14, 1882, negotiations for a settlement took place. In the meanwhile Messrs. J. L. Montefiore, W. H. Hodgkin, and D. Parrish joined the board; the two first-named on March 24, 1882, and the latter on April 21, 1882. On July 14, 1882, the following directors being present:—Sir Alexander Armstrong, K.C.B.; Messrs. P. Carnegy, C.I.E., J. L. Montefiore, W. H. Hodgkin, J. P. Bigelow, F. A. Gower, D. Parrish, the board decided to issue a writ against Colonel Gouraud and Messrs. Bigelow and Cargill for non-completion of contract, but changed their mind on August 18, as the solicitors of the company were directed to obtain the best terms that they could to settle this matter, the directors present being:—

"Sir Alexander Armstrong, K.C.B., who voted against the motion.

"P. Carnegy, C.I.E., who voted for the motion.

"J. L. Montefiore (resigned 8th December, 1882), who voted for the motion.

"W. H. Hodgkin (resigned 15th September, 1882), who voted for the motion.

"D. Parrish (resigned 2nd March, 1883), who voted for the motion.

"The terms settled were £6,800 cash, and the company to retain the 200 telephones manufactured for the purchasers. This sum of £6,800 was not paid by Colonel Gouraud and his associates, but by third parties, whom it would be unfair to introduce into the matter. On the 20th October, 1882, the solicitors were asked to give their reasons in writing for accepting the above as compromise, but this they declined to do. We are of opinion that this settlement should be closely inquired into, for if the board transferred the patents knowing that the contract would not be completed, it would appear that you have a good claim on the directors.

"Minute, July 7, 1882. Resolved, 'That Mr. F. A. Gower be instructed to sign the Oriental patent.' Present at the meeting: —F. A. Gower, Sir A. Armstrong, K.C.B., J. L. Montefiore, W. H. Hodgkin, P. Carnegy, C.I.E., Hon. H. Spensley, J. P. Bigelow.

"Patents.—It would appear from the words of the agreement, dated April 8, 1881, between Mr. Gower and your company, that that gentleman handed over his patents to you for the whole world, except for France and North America. Such was not the case. India, Australia, &c., what we know as the Oriental Patents, had been sold to the Oriental Telephone Company by Colonel Gouraud and his associates, the price paid Mr. Gower for such patents being the contract for the supply of 4,000 telephones, dated March 8, 1881, which contract was handed on to the Consolidated. The patents for Europe appear to have been given to the Edison-Gower-Bell Company. If the Edison interest had put in an equal amount of working capital with their patents, not much need have been said, as it would be a sort of partnership. What really has happened is, that your directors have given up the Gower patent to the Edison Gower-Bell-Company, have provided £15,000 working capital, and given three years' credit for a further £10,000, and yet we are working in Portugal under our Gower patent; all the Edison interest provided was the Portuguese concession, which cost a few hundreds, and the Edison patents. Colonel Gouraud is chairman of the Edison-Gower-Bell Company of Europe, and holds 95,000 shares in the company, and represents the Edison interest. The River Plate patents were handed to that company under the agreement for the 4,000 deferred shares, and supply of 3,000 telephones. You have a contract dated April 8, 1881, with the United Telephone Company, by which that company engages to purchase of you all telephones and portions of telephones comprised in the letters patent which the United Company hold. This contract can be terminated by the United Company at the end of the first seven years on its giving two years' previous notice to the Consolidated (say April 8, 1886) and paying £25,000 cash.

"Manufacturing Account.—It is a very difficult question whether the company can be worked at a profit. The figures show:—

| | | | |
|---|---|---|---|
| Year ending March, 1882 sales ... ... | £46,656 | 0 | 7 |
| „ „ 1883 „ ... ... | 37,963 | 4 | 0 |
| „ „ 1884 „ ... ... | 21,647 | 6 | 3 |

"You must take into consideration that rent (£500), gas (£100), taxes (£100), salaries (£1,000), and directors' fees (£2,000), say £3,700, have to be paid as fixed charges. Undoubtedly a profit was made in the first year of the company's existence (1881-82) principally through the Post Office contract, but on looking at the balance sheet, there appears an ominous item, £45,360 for debtors (about £20,000 of this was for the River Plate business), and, no doubt, a considerable portion of this amount has not been paid to this day. The gross profit on the year 1881-82, including interest, was £28,429; salaries, directors' fees, &c., £5,341; and £6,000 reserved for contingencies, leaving, roughly speaking, £17,000 profit. In 1882-83, the gross profit, including interest, dropped to £9,700; salaries, directors' fees, &c., £4,541; balance, say £5,159. The cash in hand was £2,198, but a loan had been contracted with the bankers of the company for £10,000 (see further on this point under the head of Issue of Fresh Capital). The amount at debit of Austrian concession was £13,427; the amount at debit of River Plate Telephone Company was £20,457; the amount at debit of Edison-Gower-Bell was £7,763. In 1883-84 the gross profit, including interest, was £7,331, salaries, &c (not including directors' fees, but giving Colonel Gouraud £104 for remuneration as deputy-chairman during Sir Julius Vogel's absence) £2,830, and balance £4,501. The sales account in this year show a loss of £6,253, but a profit is taken credit for, and income-tax paid on same, also income-tax has been paid on interest still owing by the various subsidiary companies! The amount of debit of Austrian Concession was £24,365. The amount at debit of River Plate Tel. Co. was £28,442. The amount at debit of Edison-Gower-Bell was £7,763. The £5,000 the United Telephone Company's compromise for instruments obtained from America, and £5,000 of the £6,800 received as compromise for the 4,000 telephone contract appear to have formed the profit during these last two years.

"Colonel Gouraud rejoined the board in January, 1883, as deputy-chairman at £1,000 a year, and half the surplus fees, and made it a condition that, if he accepted the post of deputy-chairman to the Consolidated Company, he should also be deputy-chairman of the River Plate Telephone Company, at £400 per annum. The directors at date of this minute: Honourable H. Spensley, who voted for. P. Carnegy, C.I.E., who voted for. Sir A. Armstrong, K.C.B., who voted against.

"Issue of Fresh Capital. In October, 1882, the board appear to have been in want of money, as they then commenced borrowing of their bankers, and on the 29th December, 1882, the bank agreed to an overdraft of £10,000, but at the end of March, 1883, they appear to have been dissatisfied, and stated that the loan must be repaid. On the 13th April, the issue of shares at 2s. 6d. discount was resolved on. On the 3rd May, the balance at the bank was

£180, and on the 4th May, the loan of £10,000 was repaid out of the proceeds of the issue, so that only £9,000 remained, and that was quickly absorbed in the Austrian business.

"Joint Accounts.—In March, 1882, a joint consignment account was entered into by the Consolidated and Oriental Telephone Company, by which the Consolidated agreed to take the management of the business, to provide the instruments at cost price with 10 per cent. added, and allow credit to the Oriental for their half of the outlay for twelve months (charging 5 per cent. for such credit) on all goods shipped to the various stations, and to divide profit or loss, as the case might be.

"The position at present is that the Consolidated has shipped goods to a present outstanding amount of £1,732. With the exception of Australia, little has been done in the way of sale of goods shipped; that at Melbourne some goods having been sold by the joint agent there the proceeds were remitted, further sales made, and proceeds were about to be sent, when an action was commenced by some parties in Melbourne against the agent for infringement of patents, and he (the agent) declines to remit until the matter is settled. The Oriental Telephone Company (chairman, Colonel Gouraud) has not yet paid the half of this £1,732, which they should do by their agreement. There is a joint consignment account with the River Plate Telephone Company, but nothing has been sold. There is also a joint consignment account with the Edison-Gower-Bell on an equally unsatisfactory basis as the Oriental, viz., the Consolidated to find the instruments, take all the risk, and halve the profits, but little has been done here. Your committee would now draw attention to one or two other points of interest.

"Sir Julius Vogel demanded, before going out to Australia to found the joint account above alluded to, £250 as a fee for doing so, and a further £250 to be taken out of the first profits realised by sales of instruments. This £250 Sir J. Vogel took at once out of first sales, not waiting for profits; we think it should be demanded back until the account is settled.

"Colonel G. E. Gouraud.—On the 4th February, 1882, this gentleman sold the Consolidated some goods to be resold to the Edison-Gower-Bell Company, of which he was and is the chairman. The amount was £143 3s. 9d., which the Colonel received in cash, but the Consolidated has not yet been paid. On the 7th March, 1882, a similar transaction took place. The Consolidated bought from him, and resold to the River Plate Telephone Company, goods to the amount of £157 12s. 9d., with the result that the money is still owing to the Consolidated. There is also an item for goods and work done of about £141, but against this is the £104 special remuneration as deputy-chairman.

"Mr. Powers.—This gentleman has been paid £500 as commission for telephones supplied to the River Plate Telephone Company, a transaction very difficult to understand, because, by the agreement, that company was bound to come to the Consolidated for instruments. The minutes state that Mr. Powers should receive this sum when the Consolidated was paid by the River Plate Company for the instruments, and yet Mr. Powers actually received the £500 in November, 1882, whilst the Consolidated remains unpaid.

"The directors present at the board were:—Sir A. Armstrong, K.C.B.; T. Carnegy, C.I.E.; Honourable H. Spensley, J. L. Montefiore, J. P. Bigelow, J. A. Mays.

"Board of Directors (at this date):—* C. L. W. Fitz Gerald, Esq., Chairman; Colonel G. E. Gouraud; P. Carnegy, Esq., C.I.E.; *Arthur Baker, Esq.; *Henry Grèwing, Esq.; Sir Alex. Armstrong, K.C.B.; the Hon. Howard Spensley."

Circulars containing remarks upon the above report were issued, one by Colonel Gouraud, and another by Messrs. Carnegy and Spensley jointly. Colonel Gouraud commenced by saying that the report contained several inaccuracies of statement which, no doubt, were accidental. With regard to the statement that "Colonel G. E. Gouraud applied for 5,000 shares and was allotted 15,000, present holding 625," he stated that his application was for 5,000, the allotment upon it having been 3,250, not 15,000 as stated. While he certainly did not hold all the shares allotted to him, he explained that when he sold those shares he was not a director of the company. His present holding by the share register is 625 shares as stated, 500 of which were his necessary qualification upon rejoining the board, and the balance, 125, he took up as his proportion of the new issue. As to the remark:—"And, lastly, a contract for 4,000 Gower-Bell telephones, signed by Colonel G. E. Gouraud and Messrs. J. P. Bigelow and W. W. Cargill," he explained that the 4,000 telephone contract was signed by him before the formation of the Consolidated Company, and merely in the capacity of a joint agent and attorney with the other gentlemen whose names it bore as representing the Edison-Bell, and other interests. The first question upon the carrying out of that contract, together with all the negociations and proceedings which led to the compromise, including the completion of the compromise, occurred at a time when he was not a director of the company.

"Colonel Gouraud rejoined the board in January, 1883, as deputy-chairman at £1,000 a year, and half the surplus fees, and made it a condition that, if he accepted the post of deputy-chairmain to the Consolidated Company, he should also be deputy-chairman to the River Plate Telephone Company, at £400 per annum."

This statement as to the stipulation for the £400 per annum as deputy-chairman of the River Plate Telephone Company was incorrect. The report omitted to mention that no part of the £1,000 remuneration, as provided, was drawn by him, he having voluntarily surrendered his right to it.

With regard to the "Oriental Company joint account," at the time the arrangement mentioned was made he was neither chairman of that company, as stated in the report, nor a director of the Consolidated Company.

Remarking upon the paragraph:—"On the 4th February, 1882, this gentleman (Col. Gouraud) sold the Consolidated some goods to be resold to the Edison-Gower-Bell Company, of which he was and is the chairman. The amount was £143 3s. 9d., which the Colonel received in cash, but the Consolidated has not yet been paid," he said:—I am afraid the facts here stated may give rise to a very prejudicial inference. I was not at that time a director of the Consolidated Company. The "goods" were material left in my hands at the time of the formation of the Edison-Gower-Bell Company. These goods were sold by me to the Consolidated Company at their request, and at, I believe, a less price than they cost me. The Consolidated Company then sold them to the Edison-Gower-Bell Company, and they formed part of the goods to which the Edison-Gower-Bell Company were entitled to three years' credit under the agreement referred to in the report. I may add that they were goods which the Edison-Gower-Bell Company was bound by the said agreement to purchase from the Consolidated Company, and could not therefore have purchased from me direct.

The same remarks applied to the paragraph referring to the transaction with the River Plate Telephone Company, except that he was not a director of the Consolidated Company, and was not, and had never been, in any way interested in the River Plate Company.

Messrs. Carnegy and Spensley's circular stated that the shares referred to in the report as having been allotted to Sir Julius Vogel, Colonel Gouraud, and Mr. Carnegy, were not taken from the minute of allotment, but from a previous minute, which purported to deal with 27,000 more shares than the company had to dispose of. The amounts actually allotted were:—Sir Julius Vogel, 3,330; Colonel Gouraud, 3,250; Mr. Patrick Carnegy, 500. With reference to the contract for the sale of the Oriental patents, the consideration for which was the profit to be made out of the purchase of 4,000 telephones, the report did not give a correct representation of the facts. The carrying out of this contract would have involved a conflict with parties with whom it was of the utmost importance to the company to remain in harmonious relations, and there were questions connected with the construction of the agreement, and the condition under which these telephones could have been used, which rendered the whole matter one of a very delicate and complicated character. The writ was, however, issued against the gentlemen referred to, and the action was proceeded with. The difficulties in the way of enforcing the specific carrying out of the contract were so great, however, that after full consideration the board, acting under the best advice they could obtain, decided to endeavour to effect a compromise. The terms of this compromise were not finally settled by the solicitors, as is assumed by the report, but were referred to the board for their final consideration and approval, and in the opinion of the board—an opinion which they had seen no reason whatever to change—the terms then agreed to were the best that could have been obtained in the interest of the shareholders.

The agreement with Mr. Gower, so far as it affected the patents, was for the sale of "the several inventions and letters patent set forth in the schedule to the agreement ('the English patents'), and all the rights and interests existing on the 1st April, 1881, of the vendor, the said Frederick Allan Gower," and other persons mentioned, "and each and every of them, in and under any patents, licenses, agreements, contracts, and other documents or muniments of title, directly or indirectly relating to telephones and the manufacture or user thereof, or any apparatus used or connected therewith, throughout the world," with the exceptions mentioned in the report. It would thus be seen that what Mr. Gower sold was all his "rights and interests," his rights and interests as regards the Oriental district being limited in fact, as the directors were well aware, to the contract for the sale of those interests, before referred to.

The report commented upon the fact that only two Exchanges have been established by the Edison-Gower-Bell Telephone Company. This fact was obviously due to the very limited capital at the command of that company. The sum of £1,000 paid to the Edison interest was specifically stated in the agreements between Mr. Edison and others and the Edison-Gower-Bell Telephone Company, to be in respect of "expenses incurred by them in relation to the introduction "of the telephone system into Italy," and was included as some consideration for the Edison-Gower-Bell Company accepting as it did the responsibilities of all expenses incurred by the Consolidated Company, "in relation to the formation of, and advertising, and soliciting applications for shares in the European Telephone Company," an abortive scheme for amalgamation, the cost of which was several thousand pounds. The formation of the Edison-Gower-Bell Telephone Company of Europe, Limited, was the result of negotiations carried on with the representatives of the Edison interest, and the terms of the arrangement were fully approved by the board. It was at the time considered impossible to work the Gower interest held by the Consolidated Company in Europe, in a profitable manner, in opposition to their larger and more powerful opponents. Colonel Gouraud rejoined the board in January, 1883, at the earnest and repeated solicitations of the majority of the board, and of the remuneration of £1,000 a year, referred to in the report, nothing whatever had been paid to

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* Appointed 23rd May, 1884.

Colonel Gouraud, being for the year in question voluntarily relinquished by that gentleman. They gladly recorded their appreciation of the services Colonel Gouraud had since rendered to the company. In the arrangement with the Oriental Company, the committee appeared to have overlooked the fact that that company stipulated at the outset that no payment should be made by the Oriental Company to the Consolidated Company for goods supplied, until payment was received by them.

Mr. Spensley added that several of the foregoing occurences took place before he joined the board.

The above report and circulars having been taken as read,

The Chairman said: Gentlemen, the committee of investigation have decided to accept Colonel Gouraud's resignation from the board. (Hear, hear.) I wrote to Colonel Gouraud on this subject and requested him to send me in his resignation in writing. Colonel Gouraud has failed to do that; why, I don't know. I am just going to make a few remarks on this document which has come from Colonel Gouraud on my report. As to the allotments, on page 4 of the minute book there is a minute dated April 22nd, 1881, and the allotment is stated in that minute to be as follows: Sir Charles Vogel, 15,000; Colonel Gouraud, 15,000; Mr. Carnegy, 2,500; and Sir Alexander Armstrong, 2,500. I understand that a great proportion of those shares are allotted to the various directors' nominees. I think I have said enough on that point.

Colonel Gouraud: No, no, Mr. Chairman! You have not read the whole of the minute. A personal attack has been made upon me, and I rely upon that sense of fair play which is the boast of Englishmen, that the judgment of the shareholders will be suspended until I have been heard.

The Chairman: My friends who know me know that I would not make a personal attack upon any man.

Colonel Gouraud: But all do not know you.

The Chairman continued reading the minute showing the allotments, which were: Mr. Scrimgeour, 75,000; Messrs. Anderson, 60,000; Sir Julius Vogel, 15,000; Colonel Gouraud, 15,000; six directors, 2,500 each; Messrs. Bell and Edison, 1,000; and Messrs. Beaton & Co., 1,000; total, 182,000. The chairman proceeded: The next remark I should like to make on this document is in reference to the 190,000 shares in the Edison-Gower-Bell Company. I copied that also from the share register—that 175,000 shares were given to Messrs. Puskas, Bailey and Gouraud, to be transferred as follows:—T. A. Edison, 72,000; Colonel Gouraud, 95,000; Messrs. Puskas, 4,000; and Mr. Bailey, 4,000. I certainly made a slight error in stating that Colonel Gouraud received £400 a-year as deputy-chairman of the River Plate Telephone Company; and as to the sales, I really don't know—they may be perfectly correct as Colonel Gouraud states them. But I thought it a very remarkable fact that we, as a manufacturing company, should have bought goods of Colonel Gouraud when we make them ourselves. Colonel Gouraud states that he was not a director at the date of the formation of the Edison-Gower-Bell Company. He resigned on the 11th August, and I find in the minutes that on the 15th August there is a letter from Colonel Gouraud, dated the 5th August, which commenced the negociations with the Gower-Bell Company. That is running it rather fine at all events. (Hear, hear.) Now, gentlemen, the moment I saw that allotment I said to myself, "That is the downfall of this company." (Hear, hear.) That is so plain. All the directors saw they could float companies easily, or thought they could, and the consequence was, they thought more of floating companies than they did of the manufacturing business. I think I need not trouble you about the issue of capital. We know very nearly all about that, and also where the money went. The next thing I would call your attention to is the 4,000 telephone contract. I can only say that that is a most mysterious business to my mind. In plain language, you, as shareholders of the Consolidated Company, paid Mr. Gower a very large sum of money for that contract; Mr. Gower cross-handed that contract on to you—may be in all good faith—and then your directors got uneasy about the gentlemen who contracted to take these telephones; they began to press them, I suppose, and when they pressed them they found they could not get the telephones taken; and this went on until the 14th July, when the board decided to issue a writ against Messrs. Gouraud, Bigelow and Cargill, and they did issue that writ. Now, there is no record whatever of what induced the directors to change their minds. I should like to know from Mr. Carnegy what induced him to change his mind, and I should like Colonel Gouraud to state why he could not fulfil the contract, because it appears to me we were perfectly ready to make the telephones and get the profit on them; and therefore I think those are points which ought to be cleared up. (Hear, hear.) I am told roughly that you paid to Mr. Gower somewhere between £20,000 and £30,000 for that contract, and you received back for that contract settled, £6,830 cash. Now that was not a very good bargain was it? [A voice: "Certainly." (Laughter.)] I am sorry to say that the £5,000 was taken as profit, was called profit in the report, and you paid income-tax upon it. ("Shame!" and "Who were the auditors?") It is nothing to do with the auditors I suppose. ("No, no," "Yes," and "Carelessness!") The auditors have certain figures put before them as profit, and they are supposed to take it as profit. . . . I don't think I need say very much about the Oriental patents. I don't know whether you understand all that extraordinary, delicate and complicated matter. I don't. Sir Julius Vogel (hisses) made this, to my mind, extraordinary agreement. Colonel Gouraud was on the opposition, and I must give Colonel Gouraud great credit for having got very much the best of the bargain. That agreement was made in Paris. Colonel Gouraud was there, I know, and Sir Julius Vogel was there, and several other gentlemen, I don't know whom; perhaps Colonel Gouraud can tell.

Colonel Gouraud: I trust the meeting will understand that Colonel Gouraud is listening with great attention and respect, and that shareholders will not take anything as admitted because he does not interrupt the chairman.

The Chairman said those agreements were something too dreadful. Referring to that with the Edison-Gower-Bell Company, he said it was extraordinary that they should create a business for other people and give them half the profit. Going on to the contract with the United Telephone Company, he said: That was a very good contract for you, provided they come for more telephones than they did. They will come for more telephones, there is no doubt about that; but at present the United Company do not give us enough orders to make the factory a paying concern from that particular item. I must tell you that you are not the absolute possessors of the Gower patents. You paid Mr. Gower a certain sum of money and you held the Gower patent for the United Kingdom in trust for the United Telephone Company. But the United Company pay £25,000 if they terminate the agreement. With regard to the manufacturing account, that is to me a very difficult thing at present. I have only been in this position about two months, and when I joined the board the business seemed in a very bad way. I don't mind telling you that the business is looking up a bit; we are doing a lot of work, and I have made it my business to go down every morning at eight o'clock to have a look around and keep things together. (Hear, hear.) I have been told by people who ought to know that I shall not be able to make the business pay; but we have a man there who tells me that he will make the business pay. My own private impression is that we can manage to make it pay a little, but not very much at present. The debts were £3,100; I have managed to reduce them to £2,400, but I really don't know where the money has come from. Messrs. Deloitte, Griffiths and Company tell me that I made a mistake in saying there was a loss of £6,300 on sales for the year 1883-4. Very good; I hope I have. It is far more satisfactory to me to know that we are making a profit, and not a loss, and you, I think, will look at it in the same light. I should tell you further that at the outset of this company, Mr. Griffiths made Sir Julius Vogel place the sum of £6,000 to meet certain questionable profits. (Hear, hear.) Sir Julius Vogel wanted to divide up all the profits at once. With regard to the issue of fresh capital, to my mind it would have been far better if the directors had taken you into their confidence and told you the exact position, because I think the business is a fairly good one, and if they had said to you, "We think we can make a profit in Austria and in the River Plate," the money would have been subscribed. It seems to me that that joint account is a very unfair one to our company, and the explanation of Messrs. Carnegy and Spensley, that it was agreed that at the outset no payment should be made by the Oriental Company to the Consolidated Company for goods supplied until payment was received by them, shows a very peculiar arrangement. We ought to try to arrange with the Oriental Company to work on a system of royalties—pay so much for leave to ship goods there and sell on our own account. The articles of association should be revised (hear, hear); in fact, those of all the companies should be, the Edison-Gower-Bell, the River Plate and the Austrian; there is very little difference in them. I am afraid we must reduce the capital account; I don't see any way out of that. As to your accounts, of course I have gone through them, but I think if you will allow me I will get an accountant, a Mr. McKay, to go through them and see if we have any claim against anybody. (Hear, hear.) Seeing the magnitude of the solicitors' bills, I have not examined them, and I should like them to be examined also; they amount to a good deal over £3,000. I have looked into the matter of the Austrian business, and I think if my suggestions are carried out we shall have a return upon that business. It seems to me also that the River Plate is a good business. The directors' fees, office expenses, and law charges are rather high. With regard to the Austrian concession, when Mr. Baker, Mr. Grewing and myself joined the board, there was a terrible personage of the name of Westley, who had an account against us of £10,000, to settle which we had about £100 in the bank; the original board seemed very much alarmed at the thought of this account coming forward. After a little pressing we got Mr. Westley to come over here, and I am very pleased to state that we found him a very nice gentleman indeed, and one, so far as I could see, solely actuated by a desire to push that Austrian business to a paying point. I believe that if we will put the money into the business to push it, it will possibly do better than the River Plate, for you must remember you have nine towns to work upon. While I am upon this subject I should like to make an allusion to Colonel Gouraud's speech. He went, as you know, to Austria, and he made a long statement at the last meeting, which I really could not understand, about limited liabilities and so on. This is most extraordinary when you come to go into it. There was no limiting the liability, because Colonel Gouraud made a further liability by taking over four further towns—small towns; and those small towns have caused me considerable anxiety. I could not see that they could be made to pay, for they are all of under 6,000 inhabitants, and of these it is not likely very many will want telephones. On going through the accounts, we found that Mr. Westley had about £7,300 owing to him by the company for wires and installations erected in the various towns in Austria, and we had a debt owing to us by the Austrian company of about

£24,800. We came together and agreed that we would take debentures of the Austrian Company for this amount, Mr. Westley to receive £7,500 and the Consolidated Company £25,500. To my mind this was the most satisfactory arrangement we could possibly make, because by some peculiar arrangement there was a clause in the agreement that the Consolidated Company could not wind up the Austrian Company. Mr. Godlee (the solicitor) tells me that we could have wound it up by incurring certain expenses in July last. [Colonel Gouraud: You could wind it up, in fact.] But that clause was in the agreement, and after I had seen Mr. Westley and heard what he had to say about it, I thought in your interest it would be far better not to attempt to wind it up, for the reason that you had so delayed to go on with the business in Austria that it was a question whether the Austrian Government would not make you forfeit your concession and take it away from you; and if it did your money would not be worth very much. But accept these debentures, send out more money and more telephones to put the business on a paying basis, and you will receive money back. The reforms I propose are the greatest economy in working, only ordering fresh stores as we require them to fulfil orders, and the reduction of directors' fees in all the companies, so as to have a little more profit on the business. I propose that there should be three directors on the River Plate Company, three on the Austrian, and three on the Edison-Gower-Bell, and that these nine should be the directors of the Consolidated Company. At present, the River Plate pays the directors £1,200; the Austrian, £1,200; the Edison-Gower-Bell, the chairman £250 and the other directors whatever the shareholders choose to give them; and the Consolidated Company, £2,000: a total of £4,650. I propose reducing these figures to—River Plate, £500; the Austrian, £500; the Edison-Gower-Bell, £300; and the Consolidated, £1,500; which will make a total of £2,800. I think I have told you nearly all I can tell you; I have told you that I think I see my way to putting the Austrian business in a paying condition; that the River Plate Company is paying; that the Edison-Gower-Bell will return on reduced expenses; and that I think I see my way at all events not to lose money on the manufacturing business of this company. But we must have money from some one. We want some of you to come forward and take up some of the River Plate shares. I am willing to take 100. I will try my best to get a settlement on the Stock Exchange for those shares; there is no reason why there should not be a quotation except that there is not a sufficient number of shares taken up. With regard to Messrs. Spensley and Carnegy's memorandum, I am glad to see that Colonel Gouraud has voluntarily relinquished his £1,000 a-year. It gives me the opening to ask the others whether they will not do the same. (Hear, hear.) I make that remark because the directors say they have drawn no fees but reserve their right to them hereafter. I beg to move "that this meeting adopts the report of the investigation committee and authorises the expenditure which has been incurred in legal expenses, printing, and otherwise."

Mr. Buckingham having seconded the motion,

Col. Gouraud said: Mr. Fitzgerald opened his speech with a personal reference to my resignation. He had a great deal to say to you about very important questions; he had a very difficult task, and one in which he has my sympathies. After opening his speech with reference to my resignation, he omitted to remind you that at the former meeting I intimated my desire to leave the company, but stated that, in pursuance of my intimation to the board, that my resignation was in their hands, yesterday he called upon me for it. Well, gentlemen, I have nothing to retract from what I said to you as to my desire to be relieved of the anxieties and labour which have for many months been imposed upon me as deputy-chairman and acting-chairman of this company. But I want to make this point perfectly clear to you that there may be no mistake. In my speech of the 23rd May I said the time had come when I could with propriety leave the company. This was in no way whatever connected with the investigation. I suggested that shareholders out of the body of the proprietary should be added to the board; three perfect strangers were suggested, and I cordially supported their election. When I received the intimation that my resignation would be accepted, it seemed in conformity with my desire. But I would have exposed myself to a very wrong interpretation on the part of the shareholders if I had not to-day appeared in my proper place at this meeting. The report of the committee has been sent out; it has contained certain inaccuracies, which have been pointed out, and certain expressions capable of wrong construction. With reference to personal matters I have said all I have to say. The report contained no accusations against anybody. Although the personal remarks of the chairman might lead me to expect that he had some personal object to persecute me, in my remarks I readily disclaimed all such belief. Of several things which he has referred to he has said that I could give the necessary explanations. I could explain every one of those things which originated on this board when I was a member. The chairman, who spoke in the first person throughout, as though he had done most of the work, has had a very difficult task to deal with. I think, and I say it without any disrespect or any implication, it would have been less difficult if he had more entirely accepted the offer I made him on behalf of myself and my colleagues when I last spoke to you. He has not done that to the extent I should have liked him to do in his own and your interests. He has, perhaps, feared that I would put a wrong construction on the things I might be apparently explaining to him. I was a perfect stranger to him, and he to me, and he has naturally shrunk from me and the other directors. I speak of it only because I think if he had been a little more frank, and not feared to receive information that would have done him no harm, his task would have been less difficult. Mr. Fitzgerald has corrected some of the wrong impressions the report would have conveyed with regard to myself, but he has not corrected them all, and I should not have expected him to do so. There is one thing—again I say it must have been the result of inadvertence, because I cannot believe any gentleman would stand up in a meeting of shareholders and do anything intentionally which he thought might mislead, if there was any doubt about it. In regard to the allotment, I might have charged him with an attempt to mislead you. He read a minute upon which I appealed to your sense of fair play. He somewhat reluctantly read the whole of that minute. What he has done has misled you, whether you think so or not. That minute was dated the 22nd April; that was not the minute of allotment. He cannot have known that. On the 26th April, four days later, the allotment of the shares took place. This effectually disposes of that question. I want to avoid speaking on anything unnecessary, and draw the line upon this perfectly clear basis, to the extent to which my name has been referred in the report of the committee. I have answered and said all I have to say, until anything more may be said—and I invite the fullest scrutiny and catechising, either here or elsewhere—but I cannot make any further allusion to myself now. The chairman has told you that the statement is correct that I have not drawn the £1,000 to which I was entitled. I was foolish not to draw it—very foolish. But the company was "hard up"; we were on the point of lending money, as directors, and so I did not take it. As to the aggregate fees of all the companies, no doubt the amount is correct; but the chairman ought to have told you two or three things which may have escaped his memory, but certainly not his observation: there has not been a single farthing drawn by any director of the Austrian Company. That company has been a mere skeleton for carrying out the contract of the Consolidated Company in Austria. The directors have had an infinity of trouble in connection with it, but they felt they could not take the fees. With regard to the River Plate Company, although the directors have had money passing through their hands constantly, they have not received any fees since a year ago last April, because we have preferred to pay others, and chiefly the Consolidated Company. As to the settlement with the Austrians, the reference in the report would lead you to suppose that the committee had made that settlement. He meant you to understand that the settlement was made by the board of the Consolidated Company. He should have added that that settlement was made as a final settlement of negotiations running over a year and a half, and which have included proposals of all kinds from Austria—very preposterous, but gradually getting a little better. The first time the chairman sat on the board to meet the Austrians, it was to consider a proposal, cut and dried, which we had been insisting upon for months. The new directors are certainly entitled to some credit for that settlement. The chairman said he "did not understand how it was that Col. Gouraud limited the liability." I made a great point about limiting the liability. The liability was unlimited, and I, as the mouthpiece of the board, succeeded in limiting it. As to the further liability I got the company into, I did take over the four towns, but that was made a *sine qua non*, a condition precedent to any negotiations. They said: "We have these towns; we cannot take half a loaf; we must have all or nothing." After the fullest consideration I determined to make the four towns part of our settlement; and this was confirmed by the board. I requested of them, and they acceded to my request, a definite statement on that point. With regard to the proximity of the formation of the Edison-Gower-Bell Company and my election on the board, I did not devise that scheme, which originated on the board of the Consolidated Company. As to the 4,000 telephone contract, now that so much has been said about it, I hope it will be probed to the bottom. (Hear, hear.)

Mr. Spensley said that with all the observations which had been made he had absolutely nothing to do. He purchased his shares at a high premium some time after the company was formed. One question, however, he was personally interested in. When Sir Julius Vogel, the chairman, left England, several of the other directors left the board, and as Sir Alexander Armstrong had an attack of illness which prevented him from taking any part in the business of the company, Mr. Carnegy and he were practically alone. He invited more than one gentleman whom he saw present to join the board, but they declined, and Colonel Gouraud was pressed to join, which he eventually did, and since that time he had done a large amount of work, and had devoted his best interests to the company, but had not received a penny in return.

Mr. Carnegy said the question which the chairman had asked him was answered in the explanation which Mr. Spensley and he had already submitted.

Mr. Cobbett moved, as an amendment to the chairman's resolution, "That the shareholders, whilst approving the action of the committee, refer the matters dealt with in the report back to the committee for a further and more specific report. (1) As to the advisability of taking proceedings against those concerned in the various transactions referred to in the report, including the reduction and taxation of the solicitors' costs. (2) As to the alteration of the articles of association recommended by the committee. (3) As to the consolidation of the boards of the various companies and changes recommended in the directorate and officials of those companies."

Mr. Germaine, in seconding, explained that the amendment was not intended to be in any way antagonistic to the resolution proposed by the chairman.

The Chairman having withdrawn his motion in favour of the amendment,

Colonel Gouraud rose to propose a further amendment, "That the committee shall refer every agreement, letter, telegram, and account, and everything else that may be incident thereto, with which appears the names of any director of the company, to Her Majesty's Attorney-General, or some Queen's counsel whom he shall select, with a view to advising the board as to the course to be taken." This, however, was ruled to be out of order, and the amendment of Mr. Corbett was carried unanimously.

Mr. Buckingham suggested that Mr. Germaine, who had evinced considerable knowledge of and interest in the affairs of the company, should be added to the board.

The Chairman, however, said he did not desire to have anyone forced upon him, and, if Mr. Germaine's name were proposed, should use the proxies entrusted to him against the proposal.

Mr. Germaine having protested against the assumption of such power on the part of the chairman, it was ultimately agreed that his name should be added to those composing the committee of investigation.

Mr. Stevens moved, "That Messrs. Spensley and Carnegy be requested to retire from the board," whereupon those gentlemen intimated their willingness to do so voluntarily, as they had not the slightest desire to remain.

The Chairman then moved, "That this meeting, having heard the report of the committee of investigation, resolves that the report and accounts, as now submitted, be received and adopted."

Sir Alexander Armstrong seconded, and the resolution was carried unanimously.

Upon the motion of a shareholder, Mr. Griffiths, of the firm of Messrs. Dever, Deloitte, Griffiths & Co., was appointed auditor, another to be elected from the shareholders.

The meeting then resolved itself into an extraordinary general meeting for the purpose of passing a resolution with respect to the settlement with the River Plate Company.

The Chairman said at the time this settlement was first proposed by the old board he objected to it, but now he thought it was very fair, and he knew no reason why they should not accept it. He moved, "That the action of the board with reference to the account of the River Plate Telephone and Electric Light Company, Limited, is hereby approved and confirmed; that the arrangement for settlement is hereby adopted, and the directors are authorised to take all necessary steps for that purpose."

Colonel Gouraud seconded the motion, which was carried unanimously, and the meeting terminated.

The following "open letter" has since been sent to the shareholders by Mr. Fitzgerald :—

"4, Hercules Passage, Threadneedle Street, E.C.,
"London, 29th July, 1884.

"To the Shareholders of the Consolidated Telephone Construction and Maintenance Company, Limited.

"Some doubt having been thrown on the accuracy of the committee of investigation's report respecting the allotment of shares in April, 1881, the following may help to settle the question :—

"Sir Julius Vogel had allotted to himself 3,330 shares, and the balance of the 15,000 shares to his nominees. Sir Julius handed in a list of his nominees to the secretary, which list was unfortunately given back to him after the shares had been placed in the nominees' names. So no record is left of the parties receiving the shares.

"Colonel Gouraud had allotted to himself 3,250 shares, and to his nominees 10,200 shares. These allotments are signed in red ink, 'Gouraud Special," and 1,000 shares were allotted to Mr. Powers, Colonel Gouraud's nephew; this makes a total of 14,450 shares.

"Mr. Carnegy had allotted to himself 500 shares, and to one nominee, 2,000 shares.
"C. L. W. Fitzgerald,
"Chairman of the Committee of Investigation."

## The Direct United States Cable Company, Limited.

THE fourteenth ordinary general meeting of the shareholders of this company was held at the Cannon Street Hotel on Friday, July 25th, when Mr. John Pender, M.P., presided.

Mr. J. W. Fuller, the secretary and traffic manager, read the notice convening the meeting, and the report, which we have already published, was taken as read.

The Chairman then said : The revenue for the half-year to 30th June, after deducting out payments, amounted to £68,573 8s. 11d., and the working and other expenses, including debenture interest and income tax, but exclusive of cost of repairs, absorbed £19,750 2s. 10d., leaving a balance of £48,823 6s. 1d. as the net profit of the half year, making with £3,524 8s. 6d. brought from the previous half year, a total of £52,347 14s. 7d., which has been appropriated as follows :—Interim dividend of 5s. per share to 31st March, £15,177 10s.; proposed final dividend of 5s. per share to 30th June, £15,177 10s.; transferred to reserve fund, £19,030 15s. 11d.; final balance of liquidation expenses, £175 10s. 1d.; balance carried forward, £2,786 8s. 7d. This makes the total £52,347 14s. 7d. The revenue shows a decrease of about £2,000 as compared with the corresponding period of 1883. This, as you are aware, is more or less due to the extreme depression which prevails in commercial circles in America at the present time, and in fact in our own country as well. The working expenditure in London and at stations compares as follows with that in the same half of last year, viz :—The salaries at stations show a reduction of £544, while those in London are £303 higher, the balance of saving on the salary items being thus £241. The items of office expenses and stationery in London, and of petty expenses, repairs, printing and stationery at the stations all show a reduction ; but this is slightly counterbalanced by a temporary increase in the cost of maintenance and renewal of instruments, and in travelling expenses, incurred principally by transferring or sending out clerks to company's stations. These two items are always more or less of a fluctuating nature. The reserve fund, after being charged with £5,127 18s. 9d. (the cost of repairing the short section of cable between Torbay and Rye Beach), and being credited with the interest on the investments and amount transferred from revenue account, shows a balance of £360,000—a net increase of £45,000 for the financial year. The reserve fund investments remain the same as in December last, the slight difference in amount being composed of additional calls on the West of India Portuguese Railway Stock. The uninvested reserve and other moneys remain on deposit at the company's bankers, in view of the repayment shortly of the Six per Cent. Debenture Loan. The present market value of the company's investments is about £11,000 more than the figure they stand at in the balance sheet. These are some of the details, which are more fully given than appear in the report, and I believe you will agree with me that upon the whole the report for the last six months may be considered satisfactory. As you are aware, both in America and at home there has been a very extraordinary commercial crisis, particularly in America. A great many men who two years ago, when I was in America, were millionaires are to-day almost penniless. With such changes as these, of course, telegraphy suffers. It is very different indeed when trade is in the other direction. Profits are made out of almost every transaction—those transactions beginning and very often ending with the telegraph, which, as you can well understand, creates considerable activity. I hope, as one extreme begets another, we may see a reaction in America, for no doubt when that takes place telegraphy will feel the effects. An important incident in the last six months has been the repairing of our short cable. The cost has been taken from the reserve fund, but we have notwithstanding placed a substantial amount to that fund, and it now stands at a figure with which we have every reason to be satisfied. I may mention that during the last few months I paid, with the traffic manager, a visit to our stations at Chester, Liverpool, and Ballinskelligs in Ireland, and I found everything in a most satisfactory state. I spent one day testing our cables, and passed a couple of hours pleasantly by carrying on a conversation by cable with Dr. Green, the president of the Western Union Company of America. It proved to me how thoroughly satisfactory our cable was, not only as to speed, but also as to accuracy; and when I came to look to the amount of matter that passed over the wires in those two hours, I was astounded. We talked about the crisis in America and its effect on telegraphy, and also about the future, and what would probably occur by-and-bye when the new cables were opened, and the marvellous accuracy and quickness with which all this was conducted would have struck any stranger with surprise, as it indeed did me, though I am chairman of the company. But quick and rapid as the system seems to be now, such is the progress of electrical science that I have no doubt at all, before very long, we may find that the present speed is materially increased. I believe, at the present moment, there are experiments going on which may lead to a most material increase in speed. When I last addressed you I spoke rather at length. I went into the history pretty much of this company, and the history of submarine telegraphy in the Atlantic generally, and I referred to the coming competition—that is, the competition which is about to take place with the Mackay and Bennett cables. Well, gentlemen, on this subject I have very little to say to-day. One of those cables has been laid. They expect to lay another, I believe, within two months; and I am told that until after the second cable is laid the competition is not likely to arise. All I can say is that, when it does arise, we shall be prepared to meet it in such a spirit as will protect your interests. I have no idea of throwing away money if we can save it, but our policy will be guided very much by the policy which the competing company may act upon. In regard to the competition, when it does arise there is one thing which I think I may safely say, and that is that we have got experience; we have also got in our combination eight cables, and whoever can do the work quickest and best is likely to get the greater share of the traffic. In commerce there is very little sentiment. Every man knows best what suits his own interest, and sentiment is a thing that he never pays for. He will employ those who do his work best, and I feel satisfied, knowing what we have to compete with, and knowing the experience of those who have to deal with the existing system, that if we do not get our full share, and probably more than our full share of the traffic, we should not be doing our duty. There is another point I may mention, and that is that the present cables are equal to a very much greater amount of traffic than we have got. Mr. Bennett has frequently stated that he is indifferent about outside traffic, as he can pretty well employ those cables for his own press purposes. That may be an advantage, and a very considerable advantage for us. There is very great competition among the press in America, and they will not let Mr. Bennett have his columns filled with English news without doing the same. And I therefore look upon it in this light—that the newspapers are not likely to send their press messages by such a formidable opponent in the press as Mr. Bennett of the *New York Herald* is. Therefore, I think Mr. Bennett's action in that respect will contribute very largely to the number of press messages we are likely to receive. However, as I said before, a few months will tell more than any prophecy of mine will do. I may mention, however, that from what I learn Mr. Mackay is a man of very considerable business ability, and that he understands exactly what he is about. I am told that he has given one of his officials the grand title of director-general, and has taken upon himself the more humble designation of manager of the company. I believe that in Mr. Mackay, while we shall have an active and energetic opponent, we shall have a man of business, who will meet us on fair ground, and that is the class of men I like to fight in a contest of this kind. There is another important point I wish to refer to, which I think met with the great approval of the shareholders at the last meeting, namely, that we are going to pay off our £100,000 of debentures, and take it from the reserve fund, still leaving a very handsome reserve. Instead of taking £100,000 out of the reserve fund, that being the amount that we have to pay off, I believe we shall only require to sell out something like £70,000 of the reserve fund, and that we shall be able to make up the balance of £30,000 out of our floating reserves. That is a point which I think upon the whole is very satisfactory. I think I have pretty well exhausted all the points to which it is desirable to draw your attention. I am reminded that by paying this £100,000 off it is a saving of £6,000 a year to us. Besides that, it places us in a more sound financial position. As to our policy with respect to the future, as I stated, I shall be able to tell you more six months hence; but that policy will always be based upon strengthening as far as we can and maintaining as much as we possibly can the financial position of the company. With these remarks I beg to move the following resolution:—"That the report of the directors, dated the 16th July, 1884, together with the statement of accounts to the 30th June, 1884, annexed thereto, be and the same are hereby adopted, and that a final dividend be now declared of 5s. per share, free of income tax, making with the interim dividends already paid a total dividend of 5 per cent. for the year ending 30th June, 1884."

Mr. Wm. Ford seconded the resolution.

Mr. Jackson, as an original shareholder, expressed his great satisfaction at the report. For seven years they had received a steady 5 per cent. dividend, and had accumulated a very handsome reserve fund. He thought the shareholders ought to be eminently satisfied at the financial results of the working of this company, for the parent company showed a bare 3 per cent. returned, and a very large proportion of its capital was deferred stock, which represented 30 per cent. of the total capital of the company, and they had only paid ¼ per cent. on that for the last two years. In conclusion, he wished to ask—Why should not the United Companies offer to carry deferred telegrams at a reduced price?

Mr. John Newton again raised the question of dividing the shares into £10 shares. It was astonishing to him that their shares should stand no better than they did in comparison with those of every other telegraph company, which did no better for its proprietors. It also struck him that the position of the company was not fairly represented by the Stock Exchange prices.

The Chairman: As to Mr. Jackson's question, do we in any way endanger the position of the company by reducing our reserve fund by this £100,000? I do not think we do, and for this reason. As you are aware, although we are a single cable—and I do not think this is always considered—we have the guarantee of seven other cables for 12 months—that is, we could not lose much in our income for 12 months, and during that period we have time to make our arrangements for repairs. We are taking up cables now from the bottom of the Mediterranean and the Atlantic, and every year convinces me more that the life of a cable is likely to be a much more prolonged one than we thought a few years ago. As I said by paying off this £100,000 we only take £70,000 from the reserve fund, and we save £6,000 a year. Well, that in a few years makes up very soon a considerable amount with the extra value of our investments. After taking away this amount from the reserve fund, it would still stand at over £300,000. That is a very handsome reserve. By this reduction of £100,000 we place ourselves altogether in a better position. If our cable broke, and we had £100,000 debentures out, we should have to pay, if we wanted more debentures, very much more interest than if we had no debentures at all. That is a very important point, and I am quite satisfied we shall strengthen our financial position by wiping off that £100,000. I think I have shown you that although we are a single cable we are uncommonly well backed, and that that backing is worth a considerable amount to the Anglo-American. When the bargain was made I think it was pretty well understood that we got a very fair share of the traffic at that particular time. Mr. Jackson has made a point which, I must say, has very often struck me—that is, that telegraphy has not made the leaps and bounds that it did in its early stages; but I must tell you that submarine telegraphy is at the cheapest an expensive luxury in business. It is rarely taken up in social life, and consequently upon the growth of trade in a great measure depends the growth of telegraphy. We are passing through very dull times, and times which I hope will not continue for ever. If we could enlist something in the way of social telegraphy, as Mr. Jackson has hinted, no doubt it would materially increase our traffic. But you must bear in mind this important point, that submarine telegraphy is not like land telegraphy. We can only carry a certain number of messages upon a submarine cable. I may say that we had tested the shilling rate and the sixpenny rate upon submarine cables, and it is a remarkable fact that at the shilling rate we only got after a year's trial something like 30 per cent. increase in traffic. That 30 per cent. left a very serious loss indeed upon the working of the cable. If we were paying handsome dividends we might experiment a little, but as we are paying what I consider a very moderate dividend indeed, we must protect the shareholders first before we deal with the general public. With regard to Mr. Jackson's suggestion, however, I have some ideas in my head which I hope will be carried out by and by. I may add that probably, as competition goes on very actively, we may reduce our rates, but that is a prophecy which I do not say much about now. As to reducing the denomination of the shares, the board have given that question their full consideration. It cuts both ways. It is true that our shares are now £20, and if we reduced them to £10 of course they would stand in the market a little above £5. That is a very great discrepancy, and it is not a position which our shares are at present entitled to occupy, because I consider the shares of this company a really valuable and great property. But which would have the greatest effect upon the investor? It is a question to me whether the shares are not better at the present moment to stand at £10 or £11 than at £5 or £6. I think the investor is a little more inclined to go in a little over par rather than a little under par. We have, however, considered this point, and I do not think at the present moment it would do the good that Mr. Newton believes it would do in the way of increasing the value of the shares.

The resolution was then put and carried unanimously.

Mr. Wm. Ford and Mr. C. J. Gunther were re-elected directors, and the auditors, Messrs. John George Griffiths and John Sawyer, were re-appointed for the ensuing year.

A vote of thanks to the chairman and the board was then carried, and the meeting closed.

## Globe Telegraph and Trust Company, Limited.

The eleventh ordinary general meeting of this company was held on Tuesday at the Cannon Street Hotel, Mr. John Pender, M.P., presiding.

The Secretary, Mr. William Payton, having read the notice convening the meeting, and the minutes of the previous meeting having been read and confirmed, the report of the directors, which we published last week, was taken as read.

The Chairman stated that the dividend this year was the same as last, namely, £4 15s. per cent. on the ordinary, and £6 per cent. on the preference stock. As regarded revenue, there had been a slight falling off on the Anglo-American preferred stock, equal to £1,546; but this year this was made up by the last dividend. The Brazilian Submarine had paid 1 per cent. less than last year, 6 per cent. against 7 per cent., a falling off of £2,548, this being caused by breaks in the cable; and the Indo-European Company paid only 8 per cent., against 9 per cent. last year, from the same cause, this equalling a decrease of £1,172. Against these items, however, must be placed the fact that the Eastern Company had paid ½ per cent. more than last year, equal to a gain of £7,895; and this had enabled this company not only to maintain its position against the previous year, but to carry forward a larger balance. The proprietary had increased during the year, there being now 7,000 shareholders—500 more than last year. The Atlantic seemed to have been a favourite channel for investing money, and even now they were about to meet with still further competition there; how it would end was difficult to say. The public would, no doubt, derive certain advantages for the moment, but whether there would be any advantage in the long run or not he could not say. There was a steady progress in telegraphy—the development being more particularly observable in the Atlantic—when trade was active; at present it was all depression, and this new enterprise would find great difficulties to contend with. Those who were already in the field were likely to do the work better than any new competitors, and he was quite satisfied that the existing cables would always have the greater proportion of the traffic. The Brazilian Company was now in a very sound and safe position, its cables having been duplicated; any company with a duplicate cable was likely to keep up a continuous earning. Concluding, he moved "that the report and accounts for the year ending 18th July, 1884, submitted to this meeting, be and they are hereby received and adopted, and that a dividend be declared payable after this day of 3s. per share on the preference shares, making, with previous quarterly payments, a total distribution for the year of 6 per cent., and of 3s. 6d. on the ordinary shares, making a total distribution for the same period of 4¾ per cent."

Sir Daniel Gooch, M.P., seconded the motion, which was carried.

Sir Daniel Gooch and Mr. William Ford were re-elected directors, and Messrs. J. G. Griffiths and W. Griffith, the auditors, were re-appointed.

A vote of thanks to the chairman and the board was then carried, after which the meeting terminated.

## The Anglo-American Brush Electric Light Corporation, Limited.

The following *ad interim* report has been sent to shareholders of this company:—In accordance with the desire expressed by several shareholders, the directors have pleasure in submitting a short report on the business of the corporation during the six months ended 30th June.

The shareholders are already aware that the proposition of the board to reduce the capital of the corporation was unanimously adopted by two general meetings, and that the special resolution on this subject was in ordinary course sanctioned by the Court. An application has been made to the committee of the Stock Exchange to quote in the official list, the new in place of the old denomination of shares, and it is expected that the application will shortly be granted.

In accordance with the suggestion contained in the annual report, which was approved by the general meeting, the directors gave the holders of partly paid shares the option of making their shares fully paid before the 1st June, and this option has been exercised by about 100 shareholders, who have paid in the aggregate nearly £8,000.

The directors are glad to be able to inform the shareholders that during the past six months further considerable progress has been made in perfecting the manufactures and in developing the business of the corporation.

The excellence of the apparatus supplied by the corporation, both for arc and incandescence lighting, is now generally recognised, and the corporation stands high in the estimation of the public not only as manufacturers of the highest class electric lighting plant, but also as contractors for electric lighting installations.

The corporation has been successful in establishing the reputation for high efficiency of their "Victoria" dynamos and lamps for incandescence lighting, and their especial suitability for the purpose of lighting ships; contracts having been obtained, among others, from the Admiralty, after severe competitive tests, for fitting up the following H.M. ships of war with the incandescence light:—*Colossus, Triumph, Raleigh, Bacchante,* and *Conqueror*. Among the other important work undertaken by the corporation, may be mentioned a provisional installation of three 500 light dynamos at Buckingham Palace, the supply of the machines for lighting the Parliament Houses at Melbourne, and the exclusive lighting of the Forestry Exhibition at Edinburgh. Although, owing to the continued depression in electric lighting generally, the volume of business effected during the past half year has not been so large as was hoped for, yet it is a satisfactory feature of the business that shipments have been made to nearly all quarters of the globe, and that there is a continuance of orders from distant countries.

In consequence of the liquidation of the Metropolitan (Brush) Electric Light and Power Company, the Brush and Lane-Fox licenses for the important district occupied by that company have reverted to the corporation, and the directors anticipate a considerable accession of business from this cause.

The directors are giving their earnest attention to the question of establishing agencies in countries and places where the interests of the corporation are not already protected by local subsidiary companies, and it affords them much satisfaction that their efforts in this direction have met with success. They have granted the sole agency for the German Empire to a firm who are able to bring adequate capital, and powerful influence to bear upon the development of electric lighting in Germany; while agencies have been granted to influential persons in other European and trans-atlantic countries.

The directors regret to have to inform the shareholders that the appeal against the judgment which was given in favour of the corporation, about the time of the general meeting, in the action brought by Messrs. Muir & Co., for £736, the price of a machine ordered by the corporation as long back as 1882, but refused on the ground that it had not been completed within the specified time, has been decided against the corporation.

The South Eastern Railway Bill, 1884 (various powers), has passed both Houses of the Legislature, and the question of whether the railway company shall take the whole or only a portion of the corporation's Victoria Works, and the compensation to be paid, will be decided under the terms of the Act, when the South Eastern Railway Company will acquire additional land for widening their line at this point, as is now in contemplation.

The half-year's working shows a net profit on trading, after including exceptional law charges, and after making provision for all book losses and depreciation of property. This result compares very favourably with the trading account of the previous year, and warrants the hope, that with even a partial revival of electric lighting enterprise, the corporation will be able to make fair returns on the capital subscribed.

In conclusion, the directors feel that there is ground for congratulation in the fact that at present not only are all charges, ordinary and exceptional, met by revenue, but that the financial position of the corporation is such as to enable the board to undertake important contracts which they have in view, involving further expenditure of capital, without asking the shareholders to provide additional supplies.

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## Anglo-American Telegraph Company, Limited.

THE report of the directors, to be submitted to the half-yearly meeting to be held on Wednesday next, is as follows:—The total receipts from the 1st January to the 30th June, 1884, including a balance of £657 4s. 1d. brought forward from the last account, amount to £231,892 18s. 2d. The traffic receipts show a decrease, as compared with the corresponding period of last year, of £13,775, consequent upon continued depression of trade between Europe and America.

The total expenses of the half-year, including repair of cables, &c., as shown by the revenue account, amount to £49,389 6s. 9d.

The directors, under the powers conferred upon them by the articles of association have, before declaring the nett profits, set apart the sum of £75,000 to the renewal fund, leaving a balance of £107,503 11s. 5d.

One quarterly interim dividend of 12s. 6d. per cent. on the ordinary stock, and of 25s. per cent. on the preferred stock, was paid on the 1st May, 1834, absorbing £43,750, and a second quarterly dividend of 17s. 6d. per cent. on the ordinary stock, and £1 15s. per cent. on the preferred stock, will be paid on the 1st August, 1884, absorbing £61,250, leaving a balance of £2,503 11s. 5d. to be carried forward to the next account.

The company's repairing s.s. *Minia* has been engaged during the half-year in repairing the 1880 cable, broken off the Coast of Ireland; the 1869 cable, broken off Brest, and St. Pierre Miquelon; the Duxbury cable, broken at the same place, and the South Placentia cable, broken at a distance of 90 miles from Placentia, N.F. She has also been engaged in the repair of the Direct U.S. Cable Company's cable, between Torbay and Rye Beach, having been chartered to that company for the purpose.

The company's entire system of cables is now in good working order.

At the general meeting held in February last, a resolution was passed by a majority of the proprietors present, recommending the directors to reduce the yearly contribution hitherto placed to the credit of the renewal fund. The resolution did not state the amount of reduction proposed, but from the discussion which followed, the meeting appeared to be desirous of reducing the yearly contribution to that fund from £150,000 to £100,000, or less. After very careful consideration of the proposed reduction, in connection with the condition of the cables, their present age and probable life, and taking the most reliable opinions which could be procured on the subject, the directors have arrived at the conclusion, that, for some time to come, no diminution can be made without great injury to the prospects and property of the company, and seriously jeopardising the proportion of gross receipts accruing to the company under the existing joint purse agreements. The directors look with confidence to the great body of the proprietors for their co-operation and support in the maintenance of the renewal fund, upon the sufficiency of which the whole existence of the company depends.

The Commercial Cable Company, promoted by Messrs. James Gordon Bennett and J. W. Mackay, appear to be actively progressing with their cable-laying operations, so that, at least one cable may be expected to be opened almost immediately. It is difficult to realise the fact that two persons could be found able and willing to embark so large an amount of capital as is required in such an enterprise as the laying of two Atlantic cables, and to accept the risk, anxiety, and responsibility incident to their working and maintenance without any reasonable prospect of profit. No information has yet been obtained as to the tariff at which the new cables are to be worked.

By the death of the Honourable Robert Grimston, which occurred in the month of April last, the directors have lost an esteemed friend and valued colleague.

Monsieur C. Crapelet, of Paris, has resigned his seat at the board, as he was unable to attend its meetings in the manner prescribed by the articles of association. It is not proposed to fill up either of these vacancies, and as the number of directors is decreased, the board have resolved to reduce the fees by £500 per annum.

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## Submarine Telegraph Company, Limited.

THE following is the report of the directors submitted at the meeting of the proprietors of this company, held at the offices, 2, Throgmorton Avenue, London Wall, E.C., on Friday, the 1st inst.:—

The annexed accounts for the six months ending 30th June, 1884, show that the gross receipts amounted to £62,757 11s. 11d., which is less than the sum received in the corresponding six months of 1883 by £1,574 11s.

This reduction is attributable to the reduced length of the messages transmitted; in the six months there were transmitted 40,410 more messages, but the number of words transmitted was 342,016 less than in the six months ending 30th June, 1883. In the first six months of 1884 the average length of a message was 12·04 words, whereas in the same period of 1883 it was 12·65 words.

The total expenses, show on the other hand, an increase of £614 12s. This arises partly from an increased sum that the French administration has charged for French clerks working the circuits between the French coast stations and London, and partly from additions to salaries of clerks and others in the employment of the company.

The net result of the business for the six months enables the directors to add to the reserve fund £7,830 9s. 1d., and to recommend a dividend at the rate of 13 per cent. per annum, carrying over a balance of £170 6s. 11½d.

The directors have frequently had occasion to refer to the unsatisfactory condition of the cables between England and Holland belonging to the English Government and worked by this company; and they took advantage of a favourable opportunity to make urgent representations to the Post Office on the subject. They have now much pleasure in reporting that the Government has laid down an excellent new cable, containing four conductors, between England and Holland, which is to replace the North Zandvoort cable, and that the South Zandvoort cable will hereafter be thoroughly overhauled by the Government.

The directors trust that this improved communication will produce a satisfactory increase in the Dutch traffic.

All the cables worked by the company are now in good working order.

**Electrical Power Storage Company, Limited.**—Notice is given that the Order of the High Court of Justice (Chancery Division) dated the 4th day of July, 1884, confirming the reduction of the capital of the above-named company from £800,000 to £200,000 and the minute (approved by the Court) showing with respect to the capital of the company, as altered, the several particulars required by the Statutes, were registered by the Registrar of Joint Stock Companies on the 23rd ult. The minute is as follows:—"The capital of the Electrical Power Storage Company, Limited, is £200,000 divided into 200,000 shares of £1 each at the time of the registration of this minute; 132,450 of the said shares are fully paid up and the remaining 67,550 shares have never been issued."

**Provincial Brush Electric Light and Power Company, Limited and Reduced.**—A petition for confirming a resolution to reduce the subscribed capital of this company from £99,205 to £54,562 15s., making the total capital £155,357 15s., was presented to the Court on the 10th ult. and is now pending. The list of creditors of the company is to be made out as for the 30th inst.

**Stock Exchange.**—The Stock Exchange Committee has granted a quotation to the following:—Anglo-American Brush Electric Light Corporation, Limited, 13,001 £5 fully paid up, and 26,999 £5 shares, with £3 paid, in lieu of those now quoted; and the Globe Telegraph and Trust Company, Limited, further issue of ordinary and preference shares.

**Cuba Submarine Telegraph Company, Limited.**—At a meeting of the directors of this company on Wednesday, it was resolved, after placing £1,266 to the reserve fund, to recommend the payment of a dividend on the ordinary shares at the rate of 9 per cent. per annum, leaving £367 to be carried forward to the current half-year's account.

**Personal.**—Mr. H. C. Harold, to whom we alluded in our last week's "Notes," has taken offices at 30 and 31, St. Swithin's Lane, where he will act as manufacturers' agent for the sale of telegraph, telephone, and electric light materials and apparatus of every description.

**The Eastern Telegraph Company, Limited.**—This company announces that the coupons on the Five per Cent. Debentures due on the 1st of August will be paid by Messrs. Glyn, Mills, Currie & Co. Coupons should be left three clear days for examination.

**Submarine Telegraph Company, Limited.** — The warrants for dividends will be sent to the proprietors on the 30th August, and be payable at the Union Bank of London on the 1st September.

**Eastern Extension Australasia and China Telegraph Company, Limited.**—Six per cent. debentures.—The coupon due on the 1st August will be paid on and after that date at the Consolidated Bank, 52, Threadneedle Street, E.C.

**British Electric Light Company, Limited.** — A petition for the winding up of this company has been presented by Mr. W. W. Mackie, of 57, Gracechurch Street, E.C., a creditor of the company.

## TRAFFIC RECEIPTS.

The Western and Brazilian Telegraph Company, Limited. The receipts for the week ending July 25th, were £2,241, after deducting the fifth of the gross receipts payable to the London Platino-Brazilian Telegraph Company, Limited.

## NEW PATENTS—1884.

10474. "Ring magnet of dynamo-electric machines." T. J. Handford. (Communicated by R. H. Mather.) Dated July 23. (*Complete.*)

10486. "Electrical switches." F. Wynne, G. C. Sillar. Dated July 23.

10487. "Construction of holders or sockets for incandescence electric lamps." R. P. Sellon, G. C. Sillar. Dated July 23.

10505. "Telephony." J. G. Lorrain. Dated July 23.

10511. "Electro-magnetic musical instruments." R. K. Boyle. Dated July 23.

10530. "Safety fuses for electric circuits." Sir W. Thomson, J. T. Bottomley. Dated July 24.

10536. "Method of depolarising electric batteries." A. C. Henderson. (Communicated by E. Bazin.) Dated July 24.

10592. "Method and apparatus for applying electricity to the scalp, &c." J. Glew. Dated July 25.

10593. "Electric battery for medical purposes." J. Glew. Dated July 25.

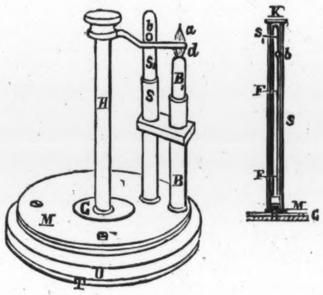
## ABSTRACTS OF PUBLISHED SPECIFICATIONS, 1883.

5539. "Supplying an electric current to the commutator of electro-motors, &c." M. Immisch. Dated November 27. 2d. Consists essentially in the use of a suitable number of separate metallic balls, each of which is caused to enter and fill an annular groove formed in the outer surface of the commutator, such balls being suitably supported in a box or other holder, so as to be capable of freely rotating therein, and preferably (by means of springs) caused to bear with a yielding pressure upon the bottom of each groove in the commutator. (*Void by reason of the patentee having neglected to file a Specification in pursuance of the conditions of the Letters Patent.*)

5545. "Microphones." F. J. Semal. Dated November 27. 4d. Relates to an improved construction and arrangement of microphones which the inventor calls simplex microphones. (*Provisional only.*)

5562. "Generating electric currents." A. B. Cunningham. Dated November 28. 2d. Has for its object to provide means whereby machinery or apparatus for generating electric currents or energy can be worked without the great waste of electricity which occurs with such machinery or apparatus as at present used. (*Provisional only.*)

5584. "Electric igniting apparatus." H. J. Haddan. (Communicated from abroad by E. Witte, of Vienna.) Dated November 30. 6d. This invention relates to micro-electric igniting apparatus, and is based on the fact that thio-alcohol ignites at a temperature of 173° Celsius, and that the smallest electric spark is therefore sufficient to ignite the same. The accompanying drawing represents an apparatus embodying the invention. The apparatus is arranged as follows:—G, G, is a disc made of vulcanite or resin and forming an electrophore, placed horizontally on the metallic disc, U, lined at the under side with cloth or flannel, T, and serving to electrify the under side of the disc, G. H is a metallic sleeve or tube serving as a handle screwed fast in the centre of the disc, G. M is a metallic disc fixed to the upper side of the disc, G, and provided with a concentric aperture, the inner flange of which is at a sufficient distance from the tube, H, to insulate the latter from the disc, M. The metal disc, M, supports a second tube, S, the lower end of which is fixed to the disc, M. The tube, S, encloses another tube, $S^1$, the lower end of which is open, while the upper end is closed. This tube, $S^1$, is filled with blotting paper, F. Parallel to the tube $S^1$ there is a third tube, B, which also encloses an adjustable tube, $B^1$, provided at the upper end with a small aperture serving to hold a small wick, *d*, fed from the sleeve, $B^1$, which is also filled with blotting paper. Near the upper end the tube, $S^1$, is provided with a hole, *b*, facing the wick of the tube, $B^1$, while a metallic arm, *a*, of the handle, H, reaches between the wick and the hole, *b*. The apparatus is operated as follows:—The tube, $S^1$, is removed and immersed for a few seconds into thio-alcohol or similar inflammable substance, and the tube, $B^1$, is immersed for the same period into benzine, after which both tubes are replaced into their respective tubes, B and S. By rubbing the electrophore on the cloth-lined disc, T, the electrophore is charged and the apparatus made ready for use. To prevent the evaporation of the liquids absorbed by the blotting paper, F, the tubes, $S^1$ and $B^1$, are closed by metal caps, K. For producing a flame, the caps are removed and the electrophore, G, lifted off the disc, U, by means of the handle, H, in consequence of which a spark is produced which passes from the radial arm, *a*, into the hole, *b*, of the tube, $S^1$, and ignites the thio-alcohol or similar inflammable substance contained in the same. The flame produced in this manner flashes out of the hole, *b*, and ignites the wick, *d*, of the sleeve, $B^1$.



5611. "Insulators." G. W. Hannam. (Communicated from abroad by S. Oakman, of America.) Dated December 3. 2d. The improved insulator is formed with a screw thread on its interior, of the ordinary style and dimensions. On the interior surface is formed an annular recess which serves to receive a coating or body of paraffin or other repellant of moisture. Immediately below this recess is formed an annular shield and an upwardly projecting recess. (*Provisional only.*)

5615. "Portable electric light apparatus." H. J. Haddan. (Communicated from abroad by J. Beduwé, of Belgium.) Dated December 3. 2d. Relates to apparatus or machinery mounted on wheels, and adapted to produce electric light at a variable height, and to throw it out in any desired direction. (*Provisional only.*)

5680. "Accumulators for storing electrical energy." J. GREENWOOD. Dated December 8. 2d. The inventor places the cells in an air receiver of sufficient strength to resist a great pressure, and of just sufficient dimensions to enclose them. This receiver is made so as to be hermetically closed after the cells are placed therein, and access to which is obtained by means of a manhole and lid of the usual kind placed in a convenient position in the receiver. The electrical circuit is established by means of ebonite or other insulating material being fixed securely in holes drilled through the receiver, and through which copper rods or other suitable conductors are run, and with which conductor connection is formed to complete the circuit. He then connects the receiver by means of a strong India rubber, or other tube, with an air pump of any kind sufficient to give the required pressure and charge the receiver with compressed air to the pressure required, which is ascertained by a gauge being attached. The best results are given by a pressure of from 75 pounds to 100 pounds to the square inch for a current up to 60 or 70 ampères, and for a current exceeding that quantity a proportionate increase in the pressure. (*Provisional only.*)

## CORRESPONDENCE.

### Heinrichs v. Westinghouse.

Thanking you for the great fairness and liberality with which you treated my case in your last leader, and the due publicity you gave it upon public grounds, so that it might serve as a warning to others when entering into agreements, I beg your permission to add a few facts to the latter advice, showing that one ought to be also very careful whom one employs as his legal adviser, and inquire into the possible position the latter holds with the other side; such an inquiry made at the right time will prevent great disappointments and a bad law case, considering that—quoting the words of the author of "Bumpkins' Law Suit"*—"There is no possibility of a reform which will lessen the needless expense and shorten the unjustifiable delay which our present system of legal procedure occasions; a system which gives to the rich immeasurable advantages over poor litigants, and amounts in many cases not only to a perversion of justice, but to a denial of it altogether."

It appeared during the trial of my action that I had trusted the defendant's solicitor to act also on my behalf when drawing that unique agreement, and he has, in fact, advised me up to the beginning of this action; thus he was well cognisant of all the defendant's deviations from the original agreement, which he ought to have prevented while advising me.

From search in the Joint Stock Companies' Register, it appears that the defendant's solicitor was also appointed solicitor and a shareholder of the Westinghouse Brake Company, of Paris and London; further, of the Glasgow Engineering Company; all of which have had instructions from the defendant, as alleged, to work my system; but, in fact, they never have done anything for me.

It appears from the same register, that the chairman of all the above-mentioned companies is Sir Henry Tyler, who was also chairman of the Brush Electric Light Company.

It is patent to my mind that a solicitor who is employed in such large interests will most probably neglect the interest of a comparatively small client, and that the Court is seemingly not only unwilling to note such a state of affairs, but actually assists the solicitor of such influential parties to any delay, as I shall presently show. I will here only mention that during the trial it appeared, from a letter from the defendant to his agent, Mr. Christy, of Pittsburgh, that the defendant had been warned by the latter that there existed in America an Electric Light combination; and, I suppose, that it was dangerous to work my system there as we all know this "corner" has lost its case against Mr. Hochhausen, of New York. Mr. Justice North refused to hear any secondary evidence on this subject.

As an example of the delay allowed to the defendant, I state that the Court gave him over 18 months' time to make a true affidavit of documents; whilst the rules of Court allow only 10 days. To parties living abroad enough time is given to communicate with their solicitors, which in no case can exceed three months.

In my case, 18 applications to the Court had to be made, and I had to obtain many orders; but the Court always gave to the defendant's solicitor further time, notwithstanding that the latter gave no proper excuse, except that the defendant was still in America. Such great indulgence with the defendant's non-compliance with the orders of Court have done me great injury in the prosecution of my action.

I cannot help drawing attention to the following facts, which I think material and instructive:—When this action was close for hearing before Mr. Justice Denman, one of the Judges of the Queen's Bench Division, who is noted for his strict impartiality and great learning, the defendant's solicitor asked for a postponement of the trial, filing an affidavit in support of his application, and swearing that their counsel advised "that since the questions in this action are wholly as to communications between the plaintiff and the defendant, it would be exceedingly dangerous to bring the case to trial in the defendant's absence"; but when the case came afterwards for trial before Mr. Justice North, the defendant's advisers thought fit to proceed to trial in the defendant's absence, and the Judge ruled I had not made out my case; he passed over much of my evidence and that of my witnesses, and declined to call the defendant (who was abroad).

Obviously, I leave all above stated facts without further comment, trusting that they will serve as a warning to others, that they may rather forego any just claim they may have, than subject themselves to such uncertainties of the present administration of the law. In conclusion, permit me to state that the defendant's right under the agreement to buy one-half share of my British, German, and French patents expired on the 1st January, 1884, and that he never has had any other right, and that he has now no claim whatever on the before-mentioned patents.

Apologising for the great length of the matter,

**Charles F. Heinrichs.**

London, *July 28th*, 1884.

### Electrical Testing Establishment.

Mr. Tiddy's experiences in regard to the above are certainly not reassuring, and I think, without some more favourable results are published, will have a rather adverse effect upon any persons whose enterprising spirit might induce them to venture in this direction.

In my own case, and I am sure I represent a large class, the use of such an establishment is of vital importance, and I am happy to say that I have succeeded in finding such a place, and had a number of experiments carried out in a most satisfactory manner, and at moderate charges.

Should any of your readers wish to avail themselves of these advantages, I may mention that at the above establishment, 36, Cleveland Street, Fitzroy Square, W., they will have a well-lighted and conveniently-arranged room, with—when present renovations are complete—40-H.P. at command.

I am sure Mr. Howard, the proprietor, will excuse me bringing his name into this controversy, as it affords me pleasure to mention his establishment, after some previous experiences, in which I have come out minus my inventions to find them "resurrected" under other names.

As to the commercial success of this undertaking I cannot answer; but as it is carried on in conjunction with other operations employing a large amount of skilled labour and machinery, with considerable steam power at command, I should imagine that here, if anywhere, a satisfactory answer could be given.

**C. Scott Snell.**

London, *July 29th.*

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* "Mr. Bumpkins' Law Suit." By Richard Harris, Barrister-at-Law. Published by Stevens and Sons, Chancery Lane. Every one should read this book before consulting a solicitor or going to law.

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